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COMPUTERWORLD

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In Depth — Roadblocks to building Euro-American networks. Page 91.

FCC to review AT&T role in long-distance market to determine if further deregulation is warranted. Page 127.

Prime cuts aim at 20% of work force, prompting user concerns about how that will affect the company's operations. Page 8.

Bell Atlantic to buy CDC service operations, dramatically increasing size and impact of its Sorbus unit. Page 14.

Windows or Presentation Manager? Reports of clamping a downsized version of the OS/2 interface on top of DOS may give you yet another interface option to puzzle over. Page 4.

Nearing its first anniversary, Legent executives recount that even the 'ideal' merger of Morino Associates and Duquesne Systems has been no endless honeymoon. Page 99.

NSF pulls plug on ETA systems at supercomputing center; university consortium denied further funding despite a bid to bring in a Cray replacement. Page 127.

Mainframe outlook stays Blue

BY ROSEMARY HAMILTON
CW STAFF

The face of the large-systems market may soon get a new look, now that Digital Equipment Corp. and Tandem Computers, Inc. have introduced mainframes. But it seems the heart of that market still belongs to IBM.

Based on interviews with IBM shops last week, a slight shift in large-system sales may take place in the wake of DEC's VAX 9000 announcement (see story page 128) and Tandem's earlier announcement of its Cyclone system [CW, Oct. 16]. Users said they would consider those systems for specialized applications that require the horsepower of a mainframe and are not directly tied to the core of their operations.

However, when it comes to their production applications, users said there is no chance they will budge from their long-term investments in IBM 370s. That environment continued to evolve last week with the introduction of the J series 3090s (see story page 129).

"If they want to compete at the high end, then they have some hurdles," said David Moore, a senior vice-president of information processing at Mellon Bank in Pittsburgh. "All my big systems have been written for the IBM system. It would not be easy to change them."

On the other hand, Moore has a number of VAX systems installed for dedicated operations such as mortgage processing. If that and other VAX-based application areas expand, a logical move would be to the VAX 9000, he said.

Moore is typical of many users who are willing to look beyond IBM and welcome the power that Tandem and DEC now offer. But they also draw a clear line between specialized and day-to-day operations.

"Our main trust system runs

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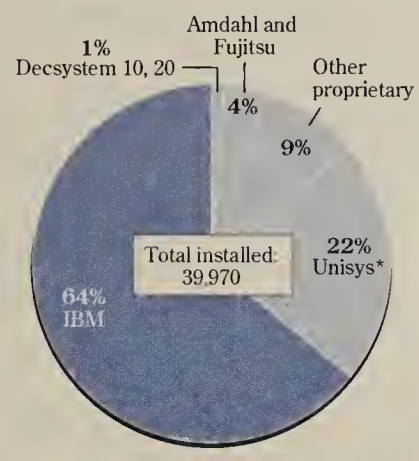
Mainframe domination

Few have been able to dent IBM's lock on the U.S. mainframe market



*Unisys' installed base represents combined Burroughs and Sperry lines

SOURCE: COMPUTER INTELLIGENCE
CW CHART: FRANK C. O'CONNELL

Defense czar snaps IS whip

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Deputy Secretary of Defense Donald J. Atwood has ordered a sweeping program to standardize and consolidate the department's many redundant information systems in an effort to make the huge U.S. Department of Defense run more like a modern business.

"The successes in industry in developing integrated management information systems suggest that much can be done in DOD," Atwood said in a recent memo, apparently drawing on his experience as an executive at General Motors Corp. The memo was circulated throughout the department.

Atwood's program, called DOD Corporate Information

Continued on page 127

Earthquake aftermath

- Telecommuting becomes a desirable option as firms contend with transportation disruptions; however, selling that option to upper management may be the toughest obstacle.
- It was a day when mainframes learned how to walk. Computer systems became moving objects as floors shook, but systems vendors report that most customer operations are up and running.
- Philippe Kahn's office is a shambles. One of three Borland International headquarters buildings was evacuated as the firm rocked just three miles from the quake's epicenter.

Stories, page 6.

Going gets tougher for Unisys

Cuts fuel staggering $648 million shortfall

BY NELL MARGOLIS
CW STAFF

BLUE BELL, Pa. — Unisys Corp. reported a staggering $648.2 million net loss for its third quarter last week on revenue up a scant 4% to $2.35 billion. The company cited steeper-than-expected costs of its sweeping product-line transition and corporate reorganization as causing the setback.

This rationale has resounded throughout the upper echelons of the computer industry during the past year. Companies have struggled to support the product lines that in many cases carried them to the top while simultaneously embracing new technologies critical to major status or even survival in the marketplace of the 1990s.

Last week, analysts and users appeared inclined to accept Unisys' explanation as a reason rather than a rationalization and to wait for the $10 billion firm to emerge on the sunny side of its grueling transition period.

"I think I'd be concerned if Unisys' problems were unique, but we're seeing declines like this pretty much across the board in the computer industry," said Gerry Connelly, MIS

Continued on page 4

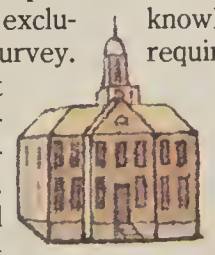
TOP 10 GRADUATE PROGRAMS

MIT, Georgia State lead IS honor roll

BY MICHAEL SULLIVAN-TRAINOR
CW STAFF

After two decades of trying to blend technical and managerial expertise into an IS graduate program, MIT's Sloan School of Management is finally receiving accolades for just that from the information systems community.

More than 250 corporate recruiters, academics and IS executives selected MIT as the best IS graduate school program in the U.S. in an exclusive *Computerworld* survey. The survey sought out the 10 best U.S. graduate schools with IS majors or concentrations. Two schools, Harvard University and Stanford University, were rated highly but did not make the top 10 because they do not have a specific IS major.



Each school on the list is striving to provide a program encompassing technical and managerial skills and business knowledge. Such a program requires tremendous resources, and none of the schools have chosen the same path to success. The following list represents the survey's results, with the schools ranked in order.

The MIT story

The list of faculty members at MIT reads like a who's who of renowned IS thinkers. The

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NEWSPAPER

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Quotable

"It's a case of David against Goliath, except the big guy has the slingshot."

CHARLES McCAIG
MUTUAL BENEFIT LIFE INSURANCE CO.

Speaking on IS' challenge in battling the massive corporate bureaucracy in an effort to change entrenched business practices. See story page 8.

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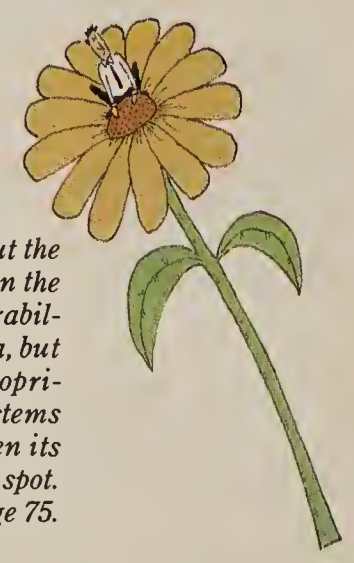

Unix put the bloom on the interoperability idea, but 'open' proprietary systems threaten its spot. Page 75.

UPDATE

As you wrestle with your meager IS budget plans . . . Despite the Tax Reform Act of 1986, a citizen watchdog group has identified a group of seven diverse corporations that paid no federal income taxes in 1988 despite earning collective profits of $1.2 *billion*. Not only did they not pay any taxes, but six of them actually received a total of $120 million in refunds and credits from their dear uncle in Washington. The group concludes that reform is working, however, as companies are starting to pay a larger share of the taxes they are legally required to pay. As Soviet emigre comic Yakov Smirnov says, 'What a country!'

CINDY CHARLES

Dennis Connors, VP of MIS at Mervyn's department store chain, has quickened inventory turnover, thanks to EDI. Page 65.

EXECUTIVE BRIEFING

■ **Core mainframe operations will remain true Blue** in most firms despite the current challenges of the VAX 9000 and the Tandem Cyclone. However, information systems executives see plenty of opportunity for IBM competitors to run dedicated applications, such as Mellon Bank's mortgage processing and Teco Energy's high-volume transactions. **Page 1.** DEC also did some significant software tweaking, offering new features in RDB and VMS. **Page 128.** Meanwhile, IBM responded with 16 new J series 3090s, but users were more excited about Hiperbatch, souped-up batch processing software designed to speed batch throughput by as much as 60%. **Page 129.**

■ **Consultant Michael Hammer exhorted 450 IS executives** to help re-engineer their companies' fundamental ways of doing business at Hammer Forum '89. But Hammer and executives from several firms that have achieved such changes warn that challenging the existing management bureaucracy takes time, money, all-out commitment and the constant involvement of senior management. **Page 8.**

■ **The San Francisco earthquake** shook the cobwebs off some area firms' plans for telecommuting, but others are still skeptical on it. California legislature is expected to consider tax breaks for firms allowing telecommuting and other flexible work options. **Page 6.**

■ **Swiss pharmaceuticals giant** Ciba-Geigy prescribes IS moving out to its functional divisions. However, the firm retains some centralized IS functions in what it calls a hybrid approach. **Page 65.**

■ **Don't worry** about being Next in line for many corporate applications on the Next machine. Last month's operating system debut gave developers a start, but analysts say late 1990 is a reasonable date for an array of Next business applications. **Page 41.**

■ **On-site this week:** The ads for the Nissan Infiniti may not have much information about the new luxury sedan, but 40 to 50 Infiniti dealers will be exchanging plenty of information on a VSAT network linked to an IBM AS/400. **Page 55.**

■ **'No Cobol required'** could be the theme song at Hayward, Calif.-based Home Express, a 12-store housewares and electronics chain. Users of the Microsoft Excel spreadsheet are able to access relevant sales information from the central database through SQL Server for customized merchandise reports. **Page 43.**

■ **Migration is a constant way of life** at Columbus, Ohio's, Huntington National Bank, which is plunging into CASE technology during its transition from Unisys to IBM mainframes. **Page 29.**

■ **Once Unix was the only** show in town for users interested in interoperability, but now choices are expanding while standards squabbles frustrate Unix users. It's not yet certain how much these factors will stunt Unix's growth, but it's clear that opportunities have been missed. **Page 75.**

■ **Despite the doom and gloom** among most major systems vendors, niche players large and small are finding financial success in the computer industry. Teradata, Mentor Graphics and Conner Peripherals were among those checking in last week with heartening third-quarter earnings results. **Page 99.**

■ **Leading edge or bleeding edge?** Some IS managers feel they'll get a career boost by applying new breeds of high-performance hardware to traditional business applications. They've tried parallel processing minicomputers to book hotel reservations. **Page 108.**

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'Lite' idea shakes up interface brew

BY PATRICIA KEEFE
CW STAFF

If *Cool Hand Luke* were set in the midst of today's graphical user interface war, the operative issue might well be, "What we have here is a failure to migrate."

In this case, defiant users are snubbing OS/2 for DOS, thanks in part to its interface, Microsoft Corp.'s Windows. As a result, a market schism has grown that could strain longtime alliances.

While Microsoft works to finish Windows 3.0, which will provide users with even less incentive to move to OS/2 and the Presentation Manager interface, IBM and a number of developers are mulling over a competing product designed to bridge the two environments.

One source briefed by IBM suggested that what is being variously called PM Lite or PM Junior is little more than a leaked brainstorm at the moment. Yet IBM reportedly plans to hit the road in an effort to drum up support for the idea.

Sources said PM Lite is a subset of its programming calls that would run under DOS and provide multitasking and a consistent graphical interface.

It allegedly would run DOS applications unmodified, allowing developers to support both worlds with one package or, at the very least, substantially reduce the work required in porting software. If so, this could cut costs for users.

There is quite a bit of skepticism among developers about whether PM Lite will work, never mind see the light of day.

If IBM goes ahead with the product, it will collide head-on with Windows 3.0, pitting IBM against longtime partner Microsoft. Steve Ballmer, Microsoft's senior vice-president of software, is not enthusiastic. "It would not seem like a smart thing for IBM to do without discussing [it with Microsoft] and getting our buy-in," he said, adding, "This is something that could hurt OS/2 and IBM."

How? By escalating the confusion in a market already struggling with two choices. If this happens, migration to PM will be delayed, some analysts and developers claimed. Basil Maloney, executive director of the Windows Presentation Manager Association, said group members are happy with Windows and unlikely to welcome PM Lite.

But that is not how developers at Lotus Development Corp. and Borland International see it. From their perspective, "tastes great, less filling" is an apt descriptor for PM Lite. A downsized version of PM would offer the same functionality used by most PM applications, theorized David Reed, a Lotus vice-president.

At IBM's Officevision unveiling this spring, the firm urged users to port their desktops to OS/2 Extended Edition; however, most have not. DOS users seeking to interact with Officevision were saddled with a poorly designed DOS requestor, said Judith Hurwitz, a vice-president at Patricia Seybold's Office Automation Group. "Users have complained in great numbers to IBM that the DOS requestor is not acceptable," she said.

Acknowledging that OS/2 is not moving quickly, IBM officials have promised to "make OS/2 support DOS better than DOS." PM Lite could be one way of doing that. Or it could backfire, shooting IBM in the foot.

Unisys

FROM PAGE 1

director at the New Jersey Sports and Exposition Authority in East Rutherford, N.J.

Although earnings reports from medium-size and smaller companies have been largely upbeat, difficult product transitions and slowed domestic sales continued to wound the giants. Unisys' disappointing figures joined underwhelming third-quarter reports already filed by IBM, Digital Equipment Corp. and Amdahl Corp. "My most important criterion in evaluating a vendor is service, and in that area, Unisys hasn't faltered," Connelly said.

Unisys' Unruh *predicts a rebound ahead*

Not impacting customer service is a high priority, said Unisys Vice-Chairman Curtis A. Hessler.

"The reorganization has left intact all our major strategic [initiatives], particularly research and development," he said. "We've pared redundancies, but we have not restructured R&D away."

At Carnival Cruise Lines in Miami, Fla., MIS director Jim Bussey also appeared unalarmed by the flow of red ink in Blue Bell.

"Ever since the transition began," he said, "we've taken a wait-and-see attitude." Moreover, he added, "We're pretty committed to Unisys now — we just installed a 2200/622."

Bussey was concerned, however, about personnel cutbacks. "With so many people gone, you can't help but wonder what effect there might be on support," he said.

Unisys said the estimated $230 million price tag attached to its planned 8,000-person work force reduction ate into the firm's profits.

Other factors contributing to the loss were the reserves forexpected losses and expenses in the company's defense business, inefficiencies inherent in a major product transition and the ongoing effects of unrelenting competition in the computer industry.

Tax deductions that were foregone because of accounting requirements also hurt third-quarter results; however, according to the company, the temporarily lost benefits, which amount to approximately $225 million, can be carried forward.

Chief Executive Officer W. Michael Blumenthal put a one-step-back, three-steps-ahead spin on his company's third-quarter showing.

The actions, he said in a statement, "will significantly enhance our competitive posture going forward and our profitability and cash flow in 1990."

Gupta SQLbase shoots for portable front end

BY PATRICIA KEEFE
CW STAFF

MENLO PARK, Calif. — Gupta Technologies, Inc. said last week it will unwrap Version 4 of its SQLbase SQL Server engine on Wednesday, along with plans to bridge to rival servers from Oracle Corp. and IBM. Gupta also plans a port to a Unix-based Sun Microsystems, Inc. server.

In addition, Gupta will be taking a swipe at Microsoft Corp.'s recent SQL benchmark, with the release of a set of benchmarks audited by Codd and Date Consulting Group in Chicago, which pit SQLbase against Microsoft's SQL Server.

Rod Zimmerman, Gupta's product marketing manager, said Gupta plans to provide a gateway linking its SQLbase engine and any of its front ends, including SQL Windows, to IBM OS/2 Extended Edition's Database Manager. Those plans are dependent on IBM's release of a multiuser version of Database Manager, which is expected to ship sometime next year.

"What we have here is the potential for a good portable front end," said Richard Finkelstein, a database consultant and principal at Performance Computing, Inc., adding that Gupta may be the first database vendor to get this far. He suggested Gupta may encounter fewer problems working with IBM's baseline SQL standard because its front end was specifically written to run on an SQL engine, unlike Dbase from Ashton-Tate Corp. and Paradox from Borland International.

There are no plans at present to build a gateway to Microsoft's SQL Server. "We are not working on it, although one of our OEMs is investigating it," Zimmerman said.

Gupta's Sun/Unix efforts will not necessarily lead to support for Sun's Network File System protocol. "It's not that we are jumping into the Unix business," Zimmerman said, citing Gupta's orientation toward local-area networks. "Networks have improved to the point where you can substitute DOS or Unix on the server."

Gupta will demonstrate a personal computer running out its SQL Window front end accessing its SQLbase server on a Sun server. "We are pretty far along," Zimmerman said, adding that the end product will be compatible with Transmission Control Protocol/Internet Protocol.

Benchmarks raise beefs

Even before their release, Gupta's benchmarks have revived an old complaint: Gupta, along with Oracle, reportedly prohibits licensees and purchasers of its SQL engine from publishing benchmarks of its product.

Gupta's benchmarks both duplicate Microsoft's test and offer a different twist — running tests in standard SQL without extensions.

"Many of these extensions do not work in cooperative processing mode or with some back ends like IBM's DB2," Zimmerman said.

In addition, Gupta's benchmarks take into account users who are doing decision support work and transaction processing, performing queries and updates simultaneously.

CORRECTION

The report on Xerox Imaging Systems' Gray F/X image processing software [CW, Oct. 2] incorrectly implied that this is the first black-and-white image editor for the IBM Personal Computer. Several packages for that platform are already shipping.

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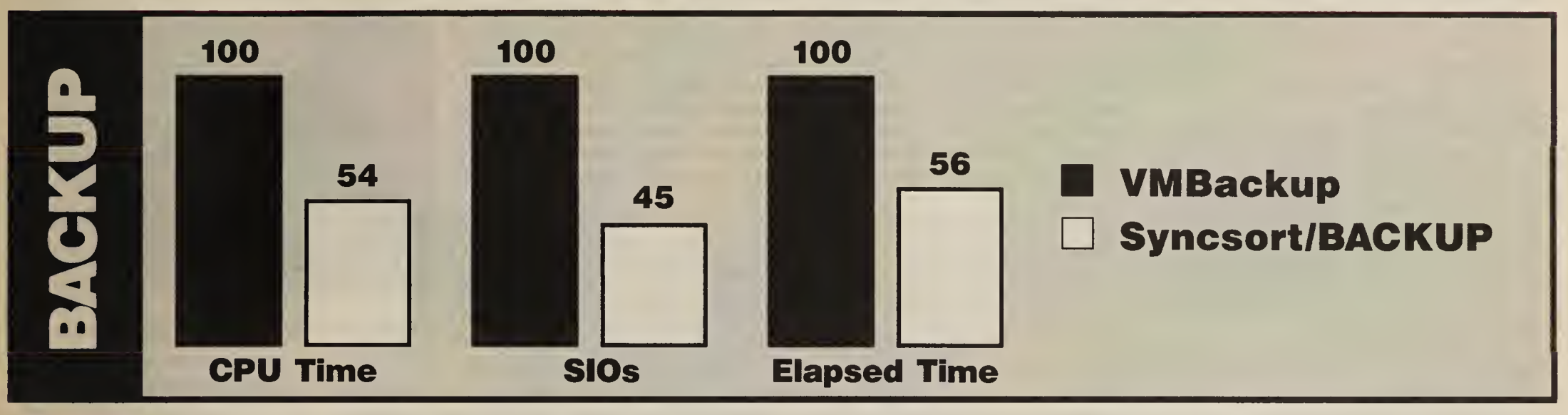

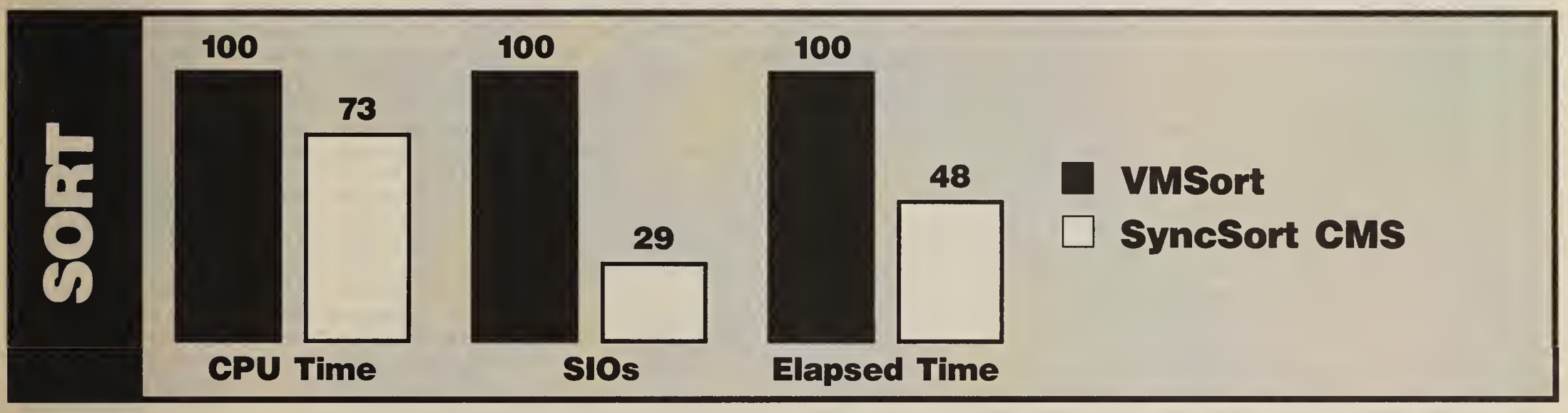

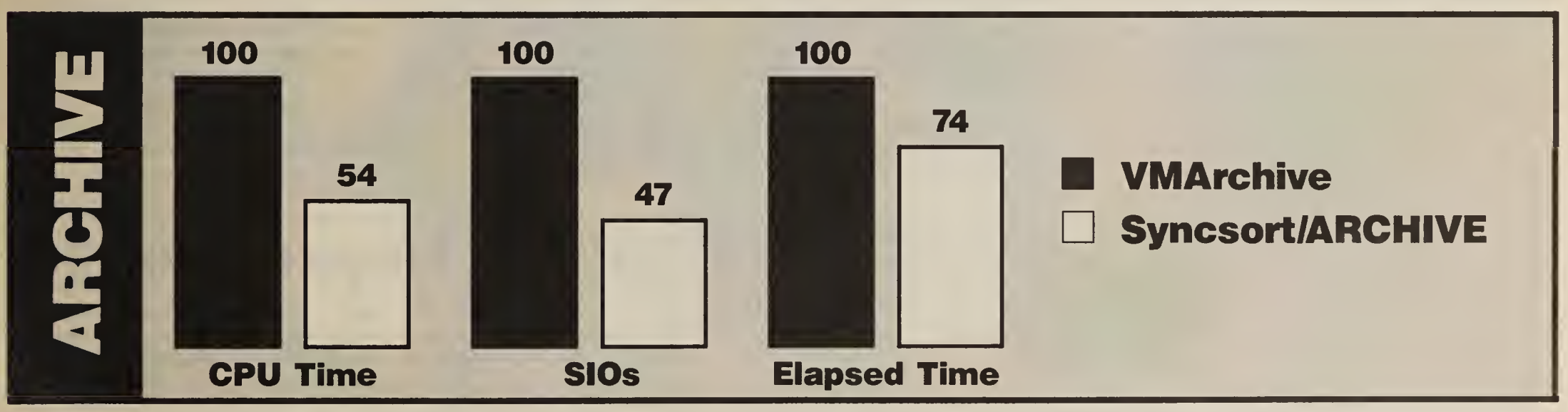

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Quake jolts new life into telecommuter idea

BY J. A. SAVAGE
CW STAFF

SAN FRANCISCO — If desire were action, 70% of the Bay Area's businesses would have telecommuting in place.

After the major transportation disruptions caused by the Oct. 17 earthquake, most representatives at an emergency meeting of businesses employing more than 200 people said they want a telecommuting option.

About 50% said they had some ad hoc telecommuting among their employees, but only a few such as Pacific Bell actually had any formal telecommuting in place before the quake, and then for only 5% of its 20,000 managerial employees.

That was plenty, though, for Robbie Neely, director of corporate communications for Pacific Bell. She and six other managers who live in the East Bay informally got together by telephone after the quake and decided that if each did not have a second phone line into their homes, they would furnish a beeper. "The technology got to the point where it worked out. Two years ago, before voice mail, it would have been maybe only 30% effective," Neely said.

Coincidentally, Levi Strauss & Co. was to begin a pilot program next week for 30 employees, according to Meg Franklin, of the firm's personnel services department. The program was set up before the earthquake.

Chevron Corp., with offices in three Bay Area cities, does not have any formal telecommuting set up, but "is looking into it," said Fred Shetz, administrator for the company's nationwide vanpool program. "Most professional people I know have their own system at home. At first we used home PCs to keep in touch, especially on Wednesday" — the day after the quake.

Employees have not had to buy their own personal computers at Hewlett-Packard Co., although there is no formal telecommuting policy. Employees who have justified working at home to their supervisors can get a "loaner" computer from the company, according to Dave Sanders, general manager of HP's Roseville Information Systems Division. The loaner system, however, is set up primarily for work at home in addition to regular work hours.

But, as evidenced at the meeting last week on flexible work options, even in a post-quake transportation crisis, middle managers may have to work stealthily to make the change.

"Most of management looks at input rather than [employee] output. If people are at their desks looking busy, then [managers] are happy," said Alice Cochran, an associate with New Ways To Work, a San Francisco nonprofit group promoting flexible work schedules and telecommuting. Cochran's group sponsored the meeting with prominent businesses and governmental agencies, including the city. "When you look at the hard numbers of cost/benefit analysis, it is hard to prove productivity increases," said Marcia Straehley, manager of policy and issues for Pacific Bell's corporate communications.

Accounting firm Ernst & Young, on the other hand, has a telecommuting option primarily used by women faced with child-care difficulties and may broaden its use while transportation systems get rebuilt. About 5% of Pacific Bell's managers telecommute on a part-time basis, said Steven Coulter, area vice-president and a telecommuter.

Ready to rebuild

The rumbling from the great California earthquake, now upgraded to a 7.1 temblor on the Richter scale, is dying down.

Continuing seismic activity beneath the Santa Cruz Mountains had generated 4,500 aftershocks as of last Thursday. Even so, the task of demolishing wrecked structures in an area bounded by San Francisco and Oakland to the north and by Santa Cruz, 60 miles south, had begun.

Repair work began as a seagoing barge pulled beside the crippled Oakland Bay Bridge, which may be closed until Thanksgiving. Workmen were trying to repair the damaged upper roadway and the lower roadway on which it landed. Engineers decided, however, that they could not be salvaged; new sections will have to be fabricated. Road conditions may not return to normal for three months, state officials said.

JEAN S. BOZMAN

Fault-y tales: Mainframes rock 'n roll

BY JEAN S. BOZMAN
CW STAFF

It was a day when mainframes learned how to walk, San Francisco-area computer users said last week. The Oct. 17 earthquake caused mainframes and minicomputers to roll around their computer rooms and PCs to fly off their desktops.

Systems vendors and disaster recovery firms reported that most of their customers were back to full operations last week. But in the immediate aftermath, resuming operations was a momentous task.

"Computers had moved as far as their cabling would allow them to. There was flooding all over the printer area, and our modem rack was tipped over at a 45-degree angle," said Roger Johnson, who manages information systems at Watsonville Hospital, within several miles of the earthquake's epicenter.

More than 150 hurt

The hospital was evacuated for safety reasons and more than 150 people were treated for earthquake-related injuries on the lawn. In the first few hours, Johnson was unable to re-enter his computer room, which houses a Digital Equipment Corp. VAX 8250 and four large DEC disk drives.

"By the time I could get back in our computer room, it looked like a bomb had gone off," he said last week.

Six hours after the quake, Johnson started to reboot the system himself, but was frustrated by an uninterruptible power supply (UPS) system too damaged to support the VAX.

The following morning, DEC field technicians restarted the VAX and a technician for the UPS company fixed the faulty power supply. Overnight, however, the VAX took several power "hits" as the city electricity came on and voltage fluctuated.

"We had sliding computers," said Jane Paradise, manager of worldwide asset protection at Apple Computer, Inc. in Cupertino, Calif. "They rolled several feet, but never came unplugged. We switched to auxiliary generators, which we used for about 13 hours."

CINDY CHARLES

Crushed car illustrates *recovery challenge*

At Matson Navigation Co., an ocean freight firm that ships goods from West Coast ports to Hawaii, a lack of UPS systems and a day-long power outage in San Francisco's financial district put business on hold until early Thursday morning.

"The equipment slid around, and some of the wheels fell into the cut-outs in our raised floor," said Jerome Hyman, assistant director of computer services. Matson's computer room is on the fifth floor of a downtown office building.

All that sliding around caused several pieces of equipment to turn over, including an IBM System/38 disk drive and several IBM-compatible tape drives. Using an iron bar, IBM customer engineers righted the equipment before the power came on, said Joe Donohue, director of IBM's National Service Division for the Northwestern region.

Luck passed them by

Other IBM customers weren't so lucky. A number of them — IBM wouldn't say exactly how many — resorted to running their applications on mainframes that IBM offered for use at IBM facilities around the country.

Disaster recovery firms filled their backup centers with temporarily displaced operations but expressed surprise at how quickly most were able to move back into their facilities.

"The earthquake had the potential to cause more severe disruptions," said John Jackson, executive vice-president of Comdisco Disaster Recovery Services, Inc. "By the time they got to our recovery centers, many had stabilized the power situation at their own data center."

All four companies that moved into Sungard Data Systems, Inc.'s hot sites had returned to their home data centers by Monday.

"By Thursday, most of them had their power back and got access to their data centers," said Sunguard spokeswoman Sue Hetzel. "But then there was a 5.0 aftershock, and they decided to stay in our hot sites over the weekend."

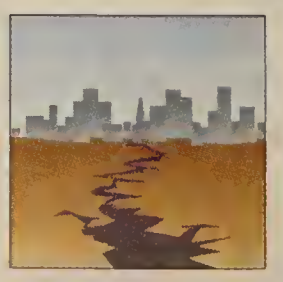
But the quake's damage, it seems, was quickly repaired. "Very few large systems were flown in, because most of our customers encountered very little damage," said DEC spokesman Nick Houpis.

Borland dusts off, keeps on moving

BY CHARLES VON SIMSON
CW STAFF

SCOTTS VALLEY, Calif. — Philippe Kahn's office is a shambles. Air blowers work to dry rugs stained from water damage caused by broken pipes; stray tennis ball cans litter the floor. The building, one of three at Borland International's headquarters here, had to be evacuated after the Oct. 17 quake. The only thing left undamaged is the golf driving cage out on the deck surrounding Kahn's office.

The rest of the company, however, is largely back on its feet in the two buildings that were left unharmed. While Borland was one of the Silicon Valley companies hardest hit by the quake, employees have bounced back quickly. "We were really close to the epicenter, but we're rebuilding faster than we got rocked," said Kahn, who was on a trip in Australia that was interrupted by the disaster. "It is back to business as usual."



When the quake hit the Bay Area, things were moving at Borland. The company was set to announce record second-quarter profits of $2.8 million, up from a $6.3 million loss for the corresponding quarter a year ago. The news came just as database rival Ashton-Tate Corp. unveiled its expected dismal results.

Borland's Quattro Pro spreadsheet, which may begin to ship in volume this week, had opened to rave reviews. And *Barron's*, the national business weekly, ran a feature article portraying Kahn as a high-tech cross between Andrew Carnegie and Aristotle.

"There is no question that prior to the quake, Borland was on a roll," said Nancy McSharry, an analyst at International Data Corp. in Framingham, Mass. "Given that the damage overall seems to be light, they shouldn't be slowed for long."

Although the company is less than three miles from the suspected epicenter of the quake, and one building had to be vacated, there was ample space in another adjacent building for the displaced administrative staff.

IBM's CIM platform moves SAA onto the factory floor

BY ELISABETH HORWITT
CW STAFF

WHITE PLAINS, N.Y. — IBM unveiled a computer-integrated manufacturing (CIM) platform last week that grafts its Systems Application Architecture (SAA) to the factory floor and is also said to allow users to tack on whatever non-IBM systems they happen to have already installed.

A large portion of IBM's 50-plus announcement deluge consisted of statements of direction that IBM hoped would provide users with a general sense of how its CIM strategy will evolve over the next year or two, vendor spokesmen said. The solid part of the introduction consisted of some product introductions, such as Manufacturing Automation Protocol 3.0 support, that extend existing SAA services into the manufacturing environment.

Kodak's Peet *will hold on to his VAXs*

SAA is said to provide a consistent set of communications, database and user presentation services over IBM's mainstream systems as well as consistent commands for applications to access those services.

IBM is "well aware that people don't want to throw away their existing systems," said Robert Williams, IBM vice-president and general manager of CIM Systems. Thus, the vendor also announced tools for integrating other vendors' products with its CIM platform. However, users who expressed interest in IBM's CIM strategy raised questions as to how far the vendor was stretching its hand to competitors' products.

Eastman Kodak's development division, for example, is seriously considering IBM's CIM architecture as it works toward a global manufacturing system, said David Peet, manufacturing systems coordinator for the division.

Still some DEC

However, while Kodak's information systems department is an IBM shop — and has, in fact, farmed out much of its operations to the vendor — its manufacturing facilities retain a fair number of Digital Equipment Corp. VAXs, "which we're not prepared to dispense with," Peet said.

Further complicating matters, he said, some operations are "pushing for decentralization" and are using a materials resource planning system that runs on Novell, Inc.'s Netware and PC-DOS. "So how do you fit that into IBM's CIM architecture?" Peet queried.

IBM announced three major methods for applications to tie into its CIM platform. One is through MAP 3.0, which will be running on most IBM systems by March 1991. A second method is through a data import/export facility, which is said to allow non-IBM systems to access data resources via IBM's CIM repository, Communications and Data Facility 1.

How much code is involved makes a big difference to Westinghouse Electric Corp.'s energy and utilities systems group, according to Richard Miller, director of IS, who said that since most of the group's product lines are autonomous, it is more interested in "bridging our islands of automation" than in total integration.

The Westinghouse group might be interested in setting up a CIM repository to integrate different manufacturing areas at each of its plants but is concerned that this does not involve "writing too much code at both ends" to tie in existing systems, Miller said.

A better way for systems to access SAA services, including the repository, is via "enablers," or software tools that IBM is in the process of developing with a number of partners.

Such tools are said to ease the effort of tying manufacturing applications to common functions such as data access, communications and user presentation, IBM claimed. The drawback is that these offerings will work only for SAA systems, plus a limited number of non-IBM systems that are deemed strategic. "We can't tie to everything," an IBM spokesman said.

For example, IBM Product Manager: Engineering Management Edition, announced this week, is said to allow production management applications based on MVS — and eventually on VM and OS/2 — to interact with engineering and computer-aided design systems via the CIM repository, to coordinate the design-to-production process and control engineering changes.

Conceding that Unix is a strong element in the manufacturing environment, IBM also announced intentions to implement CIM services on its AIX systems "over time." This would presumably include SAA-related services, even though AIX is not an SAA element.

The CIM platform market that IBM has targeted will grow 20% per year for the next few years, according to Advanced Manufacturing Research, Inc., a Cambridge, Mass.-based research firm.

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NEWS SHORTS

NAS in a name change

Mainframe vendor National Advanced Systems last week made its name change official, adopting the moniker Hitachi Data Systems Corp. The name switch came about in the wake of Hitachi Ltd. and Electronic Data Systems Corp.'s acquisition of NAS from National Semiconductor Corp. earlier this year.

CA earnings dive

Software vendor Computer Associates International, Inc. last week reported net income down 66% to $9.6 million in its second quarter ended Sept. 30. Revenue increased 5% to $282 million. CA attributed its plummeted profits largely to the acquisition of Cullinet Software, Inc. — a $333 million deal that mounted in expense as delays in closing froze customers' purchase decisions.

House closes copyright loophole

The U.S. House of Representatives recently passed a bill clarifying that software companies may sue state agencies for violating software copyrights [CW, March 27]. However, the loophole-closing legislation (H.R. 3045) still must be considered and approved by the Senate before becoming law. Adapso and the Software Publishers Association sponsored the legislation. "Only by making it possible for software developers to litigate against state institutions will the industry be able to protect its intellectual assets and curb software piracy," said Adapso Executive Director Luanne James.

PG&E exec tapped for GSA job

Thomas J. Buckholtz, a senior IS professional at Pacific Gas and Electric Co. in San Francisco, was appointed commissioner of the U.S. General Services Administration's Information Resources Management Service last week. The office is responsible for governmentwide IS and telecommunications services and acquisition policy.

Software firms stalk French pirates

The Business Software Association, based in Washington, D.C., said it will commence legal proceedings against two major French corporations for alleged software piracy. The targeted firms are Telediffusion de France, a telecommunications company, and Banque Paribas, a major financial institution.

Cray, CDC record first joint sale

The joint marketing agreement between Control Data Corp. and Cray Research, Inc. has produced its first sale with the United Kingdom Meteorological Office's purchase of a Cray Y-MP supercomputer. The Y-MP will be used for day-to-day weather prediction and climate research. Former supercomputer rivals Cray and CDC inked the marketing agreement in May, one month after Control Data folded its own supercomputer operation, ETA Systems, Inc.

VSATs to aid quake watch

Two weeks after the San Francisco earthquake, the U.S. Geological Survey has awarded a $5.5 million contract for a satellite communications network for its U.S. National Seismic Network (USNSN). Scientific-Atlanta, Inc. will connect a hub earth station at the National Earthquake Information Center (NEIC) in Golden, Colo., with up to 250 of its 1.8m VSATs in monitoring stations throughout the U.S. USNSN officials hope the VSATs, which bypass vulnerable terrestrial phone networks, will ensure speedy delivery of seismic data to NEIC.

Feds issue advanced video pact

The David Sarnoff Research Center, Sun Microsystems, Inc. and Texas Instruments, Inc. last week were named by the Defense Advanced Research Projects Agency to develop a high-definition video workstation. The workstation will be designed to display multiple video, image, computer graphics and text windows on a single high-definition screen.

Users uneasy about Prime cuts

BY NELL MARGOLIS
CW STAFF

NATICK, Mass. — Prime Computer, Inc. raised the curtain on the first stage of its new business plan last week. However, the division of the company into four profit centers and a 2,500-person work force cut unsettled some users.

The approximately 20% reduction of Prime's work force will make the troubled company "leaner and meaner," some analysts and users said. Well, said John True, IS director at California State University's (CSU) San Francisco campus, "it will certainly make them leaner."

"This is very distressing to us," said Doug Hart, MIS director at ACI America, Inc. in Placentia, Calif. "It causes more uncertainty than ever about what's really been going on at Prime in the past and what's going to happen there in the future."

An estimated 40% of ACI's approximately $300 million annual business is run on Prime computers, Hart said, "which gives us a big stake in sizable commitments Prime has made to [research and development]. I'm wondering how these massive layoffs will affect those commitments." Prime declined to specify how the cuts will be apportioned.

An analyst who requested anonymity had similar questions. "Any company might make a 10% cut for efficiency," he said, "but 20% really raises serious questions about the ongoing viability of research and development, if not the company."

No surprises

The business plan rolled out last week, layoffs included, was in line with expectations created in August by newly appointed Chief Executive Officer James MacDonald and Chairman Russell Planitzer when New York-based venture capital firm J. H. Whitney & Co. acquired Prime, a firm battered by its nine-month battle to stave off a hostile takeover by MAI Basic Four, Inc.

In its incarnation as a privately held company, Prime will be divided into four discrete business units: computer-aided design and manufacturing (Computervision), minicomputers, customer support and international operations.

Each "profit center" will have its own bottom line and will operate under a clear mandate. According to a prepared statement issued last week, Prime "will seek to commit its resources to businesses that generate acceptable return on investment."

MacDonald emphasized that the cuts, while personally painful, put Prime into necessary fighting trim. Planitzer touted the plan as one calculated to let Prime "repay its bank debt over the next four to five years" and focus more closely on customer needs.

Customers, however, were far from confident that it will. While several analysts said they were willing to give Prime's strategy the benefit of the doubt, Hart voiced doubts.

"Their current actions tell me that they're packaging these units for sale," he said.

CSU is contemplating a move to Digital Equipment Corp. and IBM.

"It's sad," True said. "They've got good products, good prices, good service. We just don't believe the operating system will be there for us."

A Prime spokeswoman last week confirmed that the company had terminated two development agreements with Intel Corp. One was to have yielded a very fast emitter-coupled logic version of the Intel Corp. I486 chip; the second would have pursued a new flavor of Unix.

Execs rethink business at Hammer Forum '89

BY CLINTON WILDER
CW STAFF

BOSTON — The massive, radical corporate changes enabled by information technology are difficult, time-consuming, expensive — and necessary.

That was the theme that brought 450 information systems and business executives to Hammer Forum '89, sponsored by consultant Michael Hammer, last week. Under the rubric of "reengineering the corporation," Hammer used his humor-spiced, energetic style to implore executives to rethink their basic business processes. Representatives of 11 U.S., Canadian and British companies spoke of significant changes that they have achieved in those business processes and the major obstacles they encountered along the way.

Mutual Benefit's McCaig

The chief roadblock to change is the entrenched way of doing business, preserved by layers of middle managers protecting their turf and further cemented by systems and applications that have only automated what was already in place. "The true value of IS is not automating what is, but creating what is not," Hammer said.

Against these immovable objects, the force for change must be an all-out, cross-functional effort, or it will fail, he said.

"It's a case of David against Goliath, except the big guy has the slingshot," said Charles McCaig, senior vice-president of corporate services at Mutual Benefit Life Insurance Co. in Newark, N.J. "We underestimate how hard it is to get people to change the way they're doing things."

Mutual Benefit Life drastically streamlined its new policy applications process, which formerly involved an average of 30 steps and 19 different employees across five departments for every new policy. The firm also made significant changes to its hierarchical management structure, including the removal of many job titles. A local-area network-based front end to the mainframe databases was the technology enabler, but the key to success was sponsorship of the project by senior management.

"If you don't have senior-level support, you'll be pulled back by the organization," McCaig said.

That was a theme sounded again and again. In several cases, the catalyst for change was a new executive hired from outside the company or industry who was not wedded to the firm's traditional business processes.

At Hewlett-Packard Co., a six-year, $6 million overhaul of the firm's purchasing function was spurred by a new materials management executive who "was aghast at our purchasing process," said Lloyd Taylor, HP's director of corporate IS.

Taylor said the new procurement system has done much more than cut inventory costs. It has increased on-time deliveries by 140%, cut lead time by 46% and reduced defective products by 75%. However, Taylor said HP had no plans to market the new applications it developed. "Someone buying the system would be disappointed if they didn't also change the underlying process," he said.

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1:IBM Journal of SAA 2:DATAPRO survey, August 1988, companies with sales over $10 million 3:Donaldson, Lufkin & Jenrette report

U.S. CONFERENCES

AL	Huntsville	Oct 11*c* Nov 30*
AZ	Scottsdale	Oct 10*af* Nov 9
CA	La Jolla	Oct 19*f*
	Los Angeles	Oct 12*, 17*f* Nov 7*am*
	Newport Beach	Oct 26*f* Nov 16
	Ontario	Oct 3*f*
	San Diego	Oct 10* Nov 14
	San Francisco	Oct 26*cf* Nov 15*al*
	San Mateo	Nov 9*
	Santa Clara	Oct 19*fl* Nov 21*ac*
CO	Colorado Springs	Oct 24
	Denver	Oct 19*cf*
CT	New Haven	Oct 12*pa*
	Stamford	Nov 9*f*
DC	Washington	Oct 17* Nov 14*f**
FL	Boca Raton	Oct 18*f*
	Miami	Nov 9*c*
GA	Atlanta	Oct 17*f* Nov 15*c*
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	Savannah	Nov 2*f*
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ID	Boise	Oct 12*l*
IL	Chicago	Oct 25*cf* Nov 15*fl*
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IN	Indianapolis	Oct 17*a*
KS	Wichita	Oct 12
KY	Louisville	Nov 16*f*
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	Worcester	Nov 1*p*
MD	Baltimore	Oct 17*c*
MI	Bloomfield Hill	Oct 10*fl*
	Dearborn	Nov 7*aa*
	Grand Rapids	Oct 12*f*
	Lansing	Nov 9*f*
MN	Minneapolis	Oct 11*ac* Nov 7*fm*
MO	Kansas City	Oct 3* Nov 8*f*
	St. Louis	Oct 10*ac* Nov 14*fl*
MS	Jackson	Nov 14*c*
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NE	Omaha	Nov 14*f*
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NJ	Cherry Hill	Nov 14*f*
	Iselin	Oct 10*f* Nov 8*l*, 29*f*
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	Buffalo	Nov 9*c*
	Melville	Oct 18*p* Nov 16*f*
	New York City	Oct 11*l*, 25*f* Nov 1a, 29*f*
	Rochester	Oct 19*c*
	Syracuse	Oct 18*f*
OH	Cincinnati	Oct 24* Nov 14*mpa*
OK	Oklahoma City	Nov 15*c*
OR	Portland	Nov 9*cf*
PA	Harrisburg	Oct 19
	King of Prussia	Oct 13*c*
	Philadelphia	Oct 24*f* Nov 7*f* Nov 28a
SC	Charleston	Oct 26*f*
	Columbia	Oct 19*c*
	Greenville	Oct 12*f*
TN	Memphis	Nov 28*
	Nashville	Oct 24*c*
TX	Austin	Nov 3*c*
	Dallas	Oct 11*i#*, 3*cf* Nov 7*fpa*
	Ft. Worth	Oct 16*f*
	Houston	Oct 19*fpa* Nov 16*cf*
	San Antonio	Nov 2*c*
UT	Salt Lake City	Oct 30
VT	Williston	Oct 19
WA	Seattle	Nov 1, 7*
WI	Madison	Nov 9
	Milwaukee	Oct 24*c*

The following key indicates additional afternoon seminars that are offered with these seminar dates:

- *a* *Macintosh Networking*
- *c* CASE/Application Tools
- *f* Oracle Financials
- *i* Oracle Int'l User's Group '89
- *l* Oracle Mail
- *m* Computer Integrated Manufacturing
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- *u* Unix

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- * Seminars held for Federal Government only.
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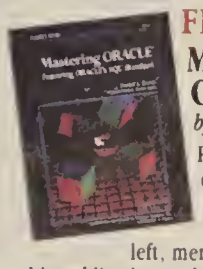

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COMPUTERWORLD

Unix Expo to hail arrival of Unix V.4

BY AMY CORTESE
CW STAFF

NEW YORK — Unix System V, Release 4, the long-awaited result of an AT&T and Sun Microsystems, Inc. effort to merge elements of the most widely used variants of Unix, is expected to highlight the Unix Expo conference this week.

In contrast with the expected near-term availability of Release 4, progress on the Open Software Foundation's (OSF) Unix offering, OSF/1, has been stalled recently, as the group charts a more ambitious course [CW, Sept. 25].

While Release 4 will get to market first, OSF/1 will have functionality that Release 4 will not have, such as multiprocessing, according to an OSF spokeswoman.

OSF had notified members several weeks ago that it was considering swapping technology from Carnegie Mellon University's Mach Unix kernel to add features such as multiprocessing and enhanced security to OSF/1. The change is likely to throw off the delivery from the original mid-1990 time frame. OSF is finalizing recommendations for OSF/1 that it will present to members at a meeting next week, the spokeswoman said.

Differences among Unix systems fuel debate, but as standards emerge, the differences may not matter as much. One set of standards is specified by X/Open Ltd., a group comprising a cross section of Unix vendors that bills itself as a neutral, unifying force in the industry.

X/Open is expected to bolster this image Wednesday with product support for its Unix standards by heavyweights on both sides of the fence — Unix International and OSF.

AT&T and Digital Equipment Corp. are expected to announce that their respective Unix operating systems, Release 4 and Ultrix, are compliant with X/Open's most recent Portability Guide. Siemens AG, which, like DEC, is a member of OSF, will also announce an X/Open-compliant product. The Portability Guide details specifications for X/Open's Common Application Environment. The CAE provides a high-level layer of standards above the operating system that X/Open says will ensure portability among compliant products.

However, as X/Open, OSF and Unix International pursue their standards agendas at a bureaucratic crawl, vendors are pushing ahead on their own courses. DEC is expected to announce a new version of Ultrix with symmetrical multiprocessing capabilities, racing past both OSF and AT&T's efforts to provide that capability.

SNA arena rivals vie head-to-head

BY ELISABETH HORWITT
CW STAFF

NCR Comten and IBM, rivals in the Systems Network Architecture communications processor arena, bumped heads last week, concurrently announcing connections between SNA and Transmission Control Protocol/Internet Protocol (TCP/IP) networking environments.

Such products are of particular interest to Department of Defense installations, according to John Abercrombie, director of computer communications for the U.S. Air Force at the Tinker Air Force Base in Oklahoma. Many are looking for ways to link their IBM hosts with Defense Data Network systems that use TCP/IP, Ethernet and X.25 packet-switching protocols, he said.

Both IBM and NCR Comten's products go beyond TCP/IP to host communications, but in different directions.

Comten's 56X5 front-end processor line, equipped with new adapters and software, is said to connect Ethernet TCP/IP local-area networks not only to IBM hosts but also to other LANs, either locally or over a circuit- or packet-switched long-distance connection, according to Comten Vice-President of Development Ronald Groenke. An existing Token-Ring adapter allows the 56X5 to act as a gateway between Token-Ring and Ethernet LANs as well, he added.

Comten also announced TCP/IP applications software that allows IBM hosts to communicate with systems using TCP/IP Simple Mail Transfer Protocol (SMTP) or File Transfer Protocol. A translation facility lets SMTP users exchange messages with IBM host users via IBM's Distributed Office Support System.

IBM's 3172 Interconnect Controller is said to provide IBM host channel connections for IEEE 802.3 Ethernet, IEEE 802.5 Token-Ring, Manufacturing Automation Protocol (MAP) 3.0, 10M bit/sec. 802.4 Token-Bus or MAP 3.0 carrier band 5M bit/sec. protocols. Based on Micro Channel/80386, the controller is said to connect up to four LANs and support two host channel connections.

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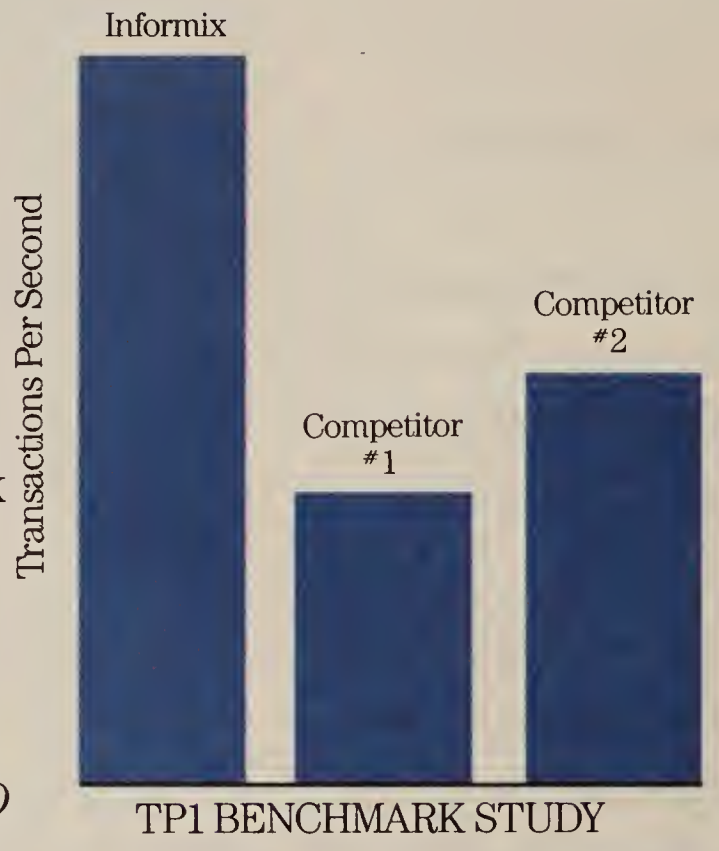

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Bell Atlantic to acquire CDC third-party maintenance unit

BY NELL MARGOLIS
CW STAFF

PHILADELPHIA — Bell Atlantic Corp. said last week it will acquire Control Data Corp.'s third-party computer maintenance business, creating an independent third-party maintenance provider more than twice the size of the No. 2 entry.

Specific terms of the deal, which contemplates folding the CDC division into Sorbus, the leading maintenance subsidiary of Bell Atlantic Customer Service division, were not disclosed.

Sorbus, which services about 60,000 customer sites, shows estimated 1989 revenue of $175 million, according to Business Development International, a computer industry consultancy in Franklin Lakes, N.J. The CDC division, according to Business Development figures, clocks in at an approximate 6,000 customers and $100 million in 1989 revenue.

The combined company "will be No. 1 among the independents, and by a long stretch," said D.R. "Mike" MacNaughton, president of Business Development. The strength potential in the merger, he added, is not merely a matter of size. "They have a pretty good product fit," he said, "and no apparent cultural clash."

Growth in key areas

Sorbus Chairman and Bell Atlantic Customer Services President Thomas Vassiliades said the acquisition will extend Sorbus' breadth and depth in key areas including workstations, distributed systems and cooperative processing.

Perhaps even more important, MacNaughton said, is CDC's position "as leading third-party maintenance provider to DEC users." Under the proposed deal, Sorbus will buy CDC's customer base and maintenance facilities for all computer platforms — prominently including Digital Equipment Corp. and IBM — other than CDC's own Cyber line, which it will continue to maintain.

Welding Sorbus' premier third-party IBM maintenance status to CDC's parallel position in the DEC world, MacNaughton said, could give the third-party maintenance market a shot in the marketing arm. "The whole [independent maintenance] industry has been suffering from profit problems, mostly brought on by IBM's extreme price aggressiveness," he noted. With third-party providers able to attract customers only by pitching prices some 10% to 15% lower than those offered by computer vendors, he said, deep discounting and price cuts by vendors can drive independents below the profit line.

Intense price-cutting by IBM was cited as the major impetus behind Sorbus' layoff of 100 workers one year ago, the first layoff in the company's history. DEC, while not yet notorious for price cuts, is bringing similar pressure to bear on the third-party providers through sheer marketing aggressiveness in the maintenance arena, MacNaughton said.

Oracle tools stress interface portability

BY RICHARD PASTORE
CW STAFF

Applications developers and end users who prefer to work with particular interfaces now have recourse to two Oracle Corp. tools announced today that feature interface portability.

According to Oracle, applications designed with these tools for its relational database management system automatically support all standard user interfaces, including IBM's Presentation Manager, Digital Equipment Corp.'s Decwindows, Apple Computer, Inc.'s Macintosh interface and the Open Software Foundation's Motif.

Applications built with SQL Forms Version 3.0 and SQL Menu Version 5.0 adopt the character mode, block mode and bit-mapped user interface of the target platform.

This adaptability allows developers to concentrate on application content rather than on recoding applications to support different hardware environments and interfaces, the company said.

The interface independence of the application liberates end users as well. "Organizations [can] select hardware based on price/performance criteria rather than software compatibility alone," said Sohaib Abbasi, vice-president of Oracle's Tools and Graphics Group.

Now in beta testing, the tools are slated to ship in 60 days with support for the DEC VAX/VMS character-mode interface. Support for the other interface modes is expected to ship in the second quarter of 1990.

SQL Forms and SQL Menu require Oracle Version 6.0 and are priced from $1,500 to $70,000, depending on platform and system configuration.

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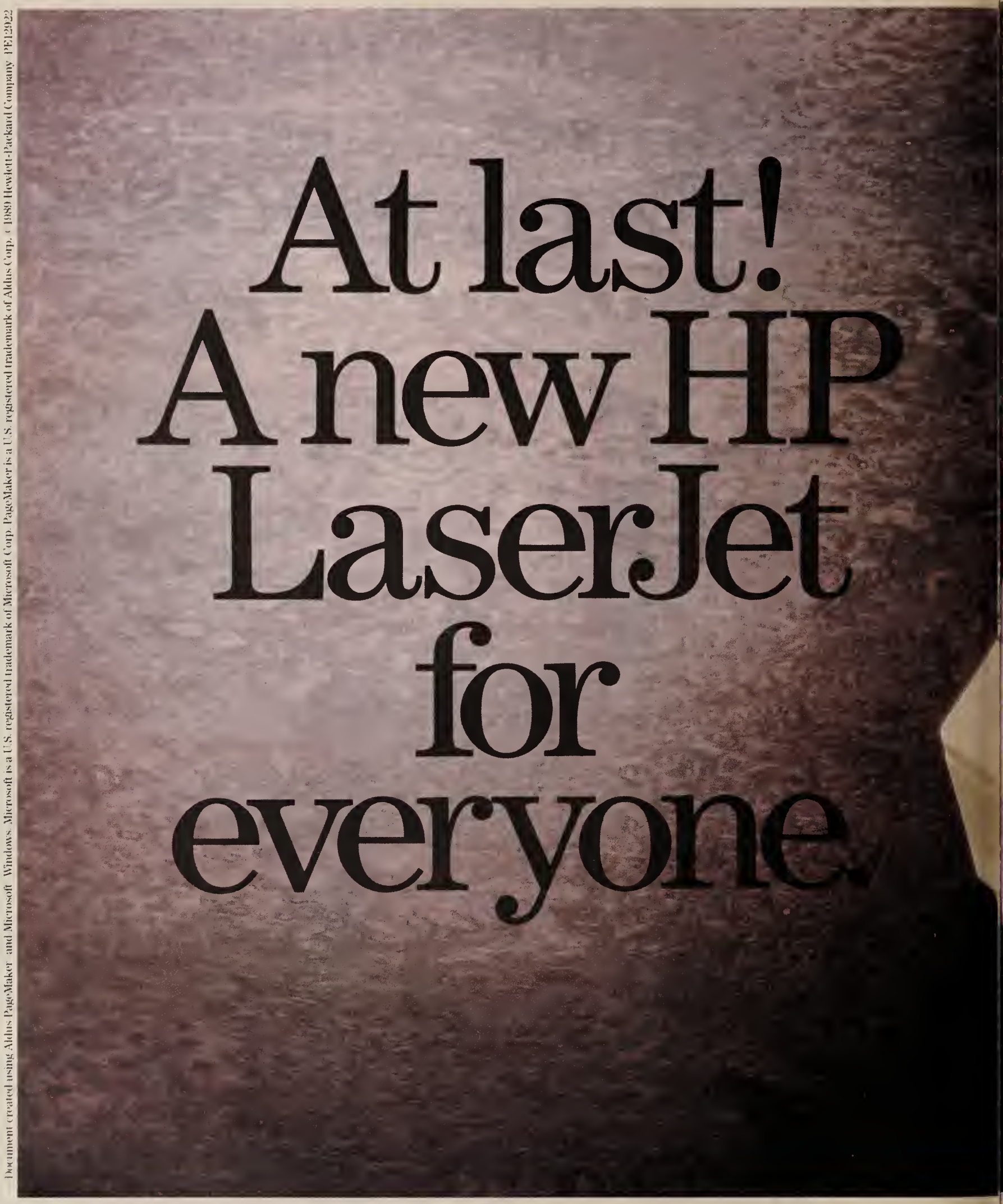

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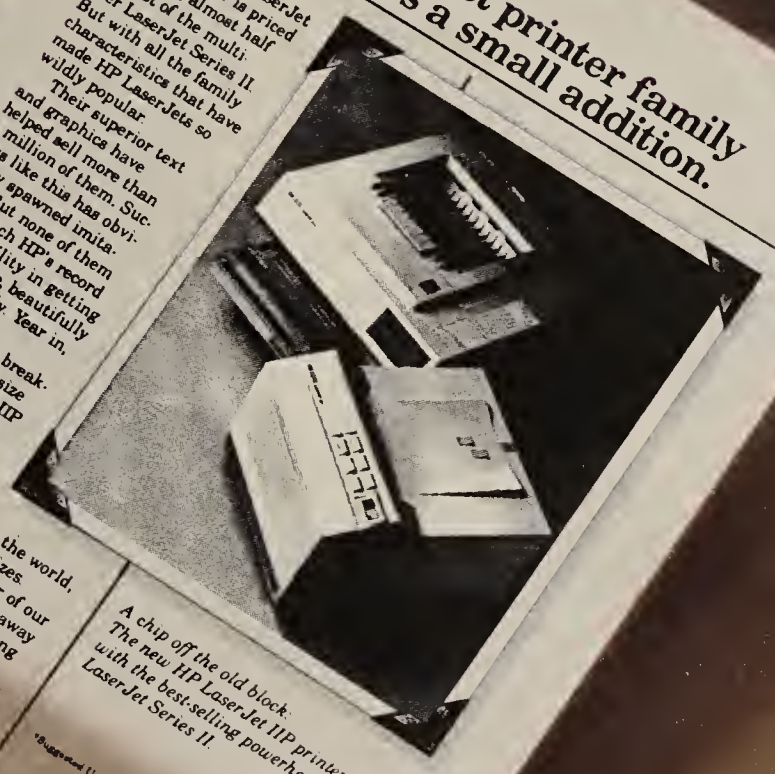

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Unisys states CASE for 4GL lineup

BY ROBERT MORAN
CW STAFF

NEW YORK — Unisys Corp. took steps last week to carve out a role in the developing market for computer-aided software engineering tools.

The company announced a series of enhancements to its fourth-generation languages — Linc and Mapper — and said it has begun porting tools to Unix processors outside of its proprietary base. The company has also developed an interface to third-party design and analysis tools.

Despite the merits of Linc II and Mapper as computer-aided software engineering (CASE) tools, analysts said the company's battles will be fought on a marketing front rather than a technological one.

"Unisys has the potential with their set of tools to play an important role in systems development," said George Hathaway, vice-president of the Index Group, Inc., a consultancy in Cambridge, Mass. "But their platforms limit their potential."

Unisys has said it accepted orders to bring Mapper to such platforms as AT&T, NCR Corp. and the IBM RT workstation and added that it is doing the same for Linc II.

Marketing front

On the marketing front, analysts pointed to Unisys' use of a process-driven methodology rather than the stronghold of data-driven CASE methodologies in the IBM world of information systems.

Unisys said it will provide an open interface to allow third-party analysis and design tools to integrate with the Linc repository. The interface is slated to be out in the first quarter of 1990.

"The interface acknowledges existing investments in front-end tools and gives Unisys users some CASE-like functionality, which they generally lacked," said Bill Martorelli, vice-president of New Science, a consultancy in Southport, Conn.

Further, Unisys announced Linc Design Assistant (LDA), a $4,500 graphical front end to Linc, based on MS-DOS and an object-oriented language. When LDA becomes available in December, users will be able to construct and manipulate a diagrammatic representation of the design and view the interrelation between the components, the company said.

Companies with current Linc systems will be able to use the tool for reverse-engineering and to view or document their object-model representations.

According to Phil Pyburn, president of Pyburn Systems in Boston, Linc previously provided screens and reports about the system but did not offer abstract representations of the system at the very high end.

"With the front end, developers can describe the system at a higher level of abstraction, which helps us describe the system in a way that is meaningful to the user," he said.

However, Pyburn said Linc was a perfectly fine development tool before the debut of LDA. "I have a feeling that a lot of this CASE front-end stuff is more fluff than substance," he said.

Unisys also announced the Linc Systems Approach (LSA), a software tool that guides developers through each stage of building a Linc system and helps designers perceive business activities in their entirety rather than as separate data, process, function or flow control processes, the company said. Available immediately, the product costs between $1,500 and $1,800, depending on processor size.

The company also announced Mapper C Release 4R1, with interfaces to IBM's DB2 and Oracle Corp. databases as well as new graphics and on-line documentation. The company said the release will ship in the middle of December.

Depending on processor size, the runtime version costs from $2,000 to $18,000. The development version ranges from $6,800 to $60,000, depending on the size of the processor.

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Got it ?!

EDITORIAL

Quaker notes

GENERALLY, THIS SPACE is used for sundry spleen-ventings from senior editorial management on subjects ranging from government bureaucrats to irresponsible vendors to idle IS management.

And this week, we'll target these groups again. Only this time, the effort will be in finding the proper words to praise them for the truly phenomenal effort put forth in minimizing the systems damage from one of nature's most violent convulsions, the Bay Area earthquake.

Never before in any other part of the world has an area so rich in users and vendors of IS technology been struck by such a calamity. That there was so little lasting systems damage, especially to such vital concerns as hospitals and utilities, is a tribute to preparedness beforehand and cooperation afterwards.

So for meritorious valor above and beyond the call of duty, the *Computerworld* editorial Legion of Honor medals go to (in no particular order):

The communications carriers. Pacific Bell, the local carrier, sustained very minor damage to corporate headquarters. Why? Because it recently spent several million dollars earthquake-proofing its facilities.

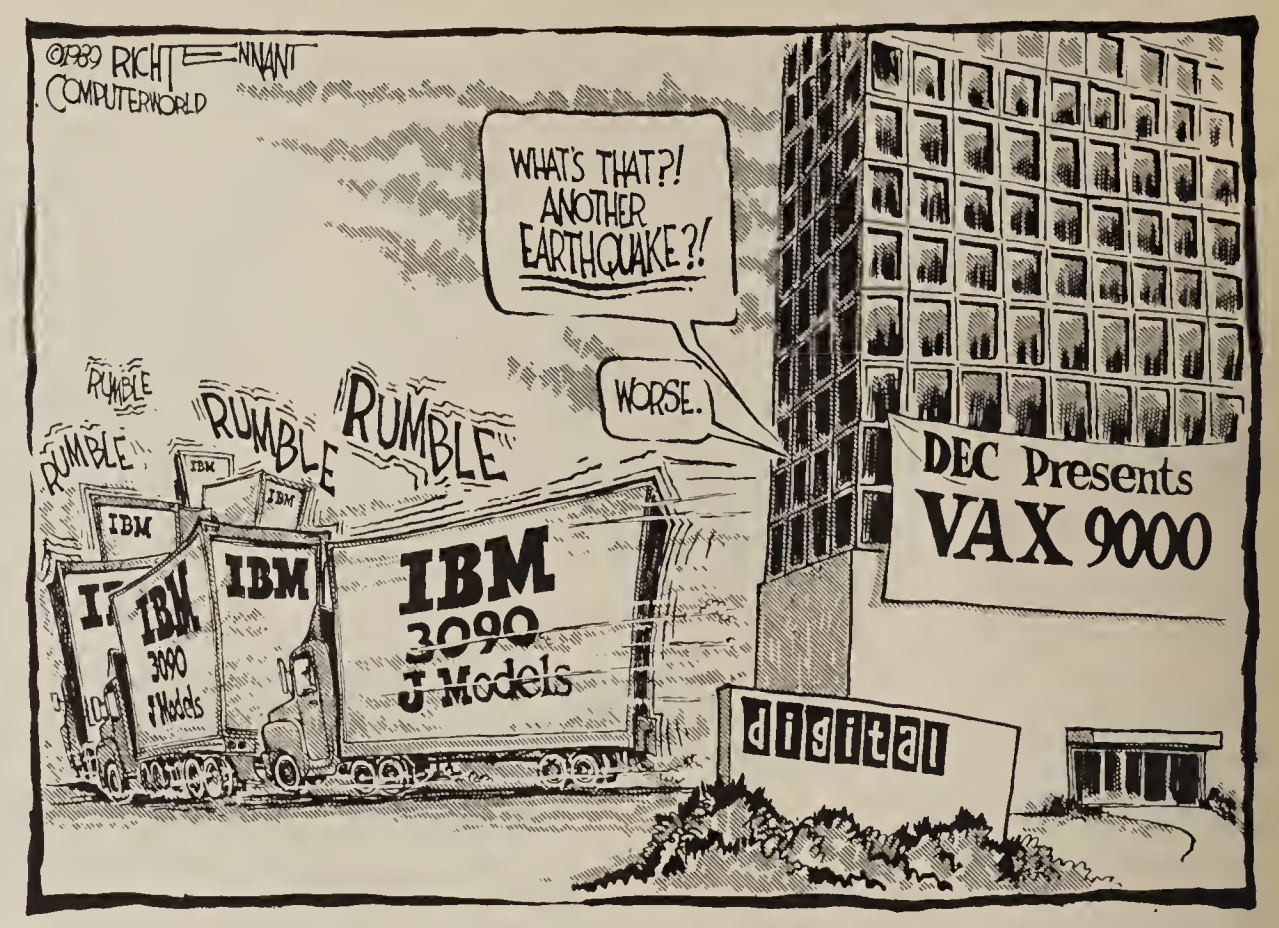
The major long-haul carriers, AT&T and MCI, processed 2½ times the normal traffic in the hours immediately following the quake. Emergency signal-blocking procedures ensured that intra-LATA traffic was handled with maximum efficiency.

As the saying goes, the network is the system; thanks to these guys, the system took a lickin' but kept on tickin'.

The IS 'boy scouts.' Their motto: Be prepared. And prepared they were. From Wells Fargo to Clorox to the University of California to Bank of America, steps taken by IS managers anticipating disaster paid off handsomely. Better than eight of 10 ATMs continued to spit out emergency funds. Automated production lines were humming within 48 hours, less in some cases. Remarkably, even vibration-sensitive disk farms suffered little as IS slowly brought systems down in accordance with predetermined disaster plans.

The disaster recovery outfits. The Comdiscos, Sungards and other vendors in the "black-and-blue" trade definitely earned their pay, largely because of power outages. Organizations in need were prioritized and then served accordingly. One estimate held that less than 20% of IBM mainframe sites are covered by disaster recovery services, a number that is clearly higher in the Bay Area.

In essence, the preparedness for a truly unpredictable disaster paid off royally for Bay Area users, just as the general preparedness in the area greatly minimized the loss of life from such a tremendous shock. Just think: Seismologists maintain that this same event could occur in perhaps half of all U.S. cities.



LETTERS TO THE EDITOR

A better image

Regarding "Insurers wary of image risk" [CW, Sept. 25], I was interviewed almost four months before the article and quoted out of context. A better headline, based on your experience and the comments of your visitors, would have been "Insurers excited about image."

An image system can be used in two ways — to process and to store the mail after it has been processed. Quoting only the numbers for processing work gave the impression we had hardly begun, rather than being almost done. By only listing one type of benefit, rather than the three I described, the project seemed to only break even, rather than being a big winner.

The information was also out of date. In early June we were expanding from 63% to 77% of the mail stored and reached 100% on July 10. We were only processing 16% of the mail, as reported, but by mid-September were handling 50% and are at 65% today. We may have had only 300 terminals installed in June; by mid-September 1,022 terminals were in use, and the number is still rising.

The primary advantages of image are in a large installation (if only a few people share the files, it is still cheaper to have all of them sit next to a filing cabinet). A large installation of a new technology takes time and care. The hundreds of people I have talked with are proceeding as carefully as anyone would with a multimillion-dollar investment. At the same time, they remain as enthusiastic as our users.

Charles A. Plesums
Director of Image Systems
USAA
San Antonio

New CA look

I have never been a fan of Computer Associates International, Inc., although we do operate two of their financial packages. My lack of enthusiasm for the company is partly due to prior experience concerning their manner of customer relations and product reliability. It was with no small amount of anticipation, therefore, that I attended the recent Cullinet User Week in Atlanta, which was the subject of "Cullinet conference soothes users' fears" [CW, Oct. 2].

Following the Executive Management Meeting, however, I was left with a much more positive view of CA than I would have anticipated. CA Chairman Charles Wang's remarks to the audience were aggressive, promising and forthright. When confronted with a question for which he and the executive staff had no answer, he admitted it and promised one.

While my April 1989 purchase of the IBM Mainframe Generator is finally to be released in the near future (Nov. 1, 1989 is now the release date) as a production version, I have to admire the strategic business decision made by CA to finish/clean up development on all existing software prior to allocating resources to the development of new software. After all, if you do not know where you are, how can you know where you are going? I remain cautiously optimistic that customer support is finally coming of age as a corporate priority at CA.

In one-on-one discussions with Wang I voiced my own concerns as to CA's future support for Cullinet users. I echoed his opinion that "talk is cheap" and his follow-through would be what mattered.

So, Wang, please be advised that the meter is running and the eyes of an anxious CA (formerly Cullinet) user community are upon you.

James T. Werther
Vice-President
Information Systems
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Burlington, Vt.

This week in history

Oct. 29, 1979
The same problems that forced IBM to substitute 16K-bit memory chips from other manufacturers for the more sophisticated 64K-bit chips in 4341 memories may also stall the H series of superprocessors.

Oct. 29, 1984
Recent scientific reports suggest that very-low-frequency radiation emissions from VDTs could be biologically harmful.

Since protective laws for VDT operators have yet to pass in any state, U.S. and Canadian clerical workers turn to unions to address health and safety concerns such as the effect of computer use on general health, stress levels, vision and pregnancy.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.*

Can DEC keep morale high?

GLENN RIFKIN

September 1987. Digital Equipment Corp. is red-hot. The stock hits $198 per share as the company prepares for its mammoth Decworld exhibition. The Maynard, Mass. minimaker is hiring thousands of new employees to keep up with seemingly insatiable demand for its machines.

October 1989. The rocket has landed with a loud thump. The entire computer industry is slumping badly, and DEC is feeling the pain acutely. Its stock drops to $86, a 52-week low. U.S. sales are off, and net income dropped for the fifth straight quarter for the Maynard giant. A salary freeze for all U.S. employees continues for the fourth straight month, and the first iteration of an employee attrition program begins in Salem, N.H. Although employees believe they are better off than their counterparts at Wang or Data General, a widespread malaise has set in at DEC.

The company's electronic mail network is constantly abuzz with angry and questioning comments from employees. Rumors of layoffs fly as employees continually wonder what Ken Olsen has in mind for the thousands of idle hands within the company. Resentment spreads among U.S. employees who are starting to question the fairness and necessity of the continued U.S.-only salary freeze.

In the midst of all this, Jack Shields, one of DEC's most powerful senior executives, resigns in the wake of published reports that he has angered Olsen with his handling (or mishandling) of DEC's sales organization.

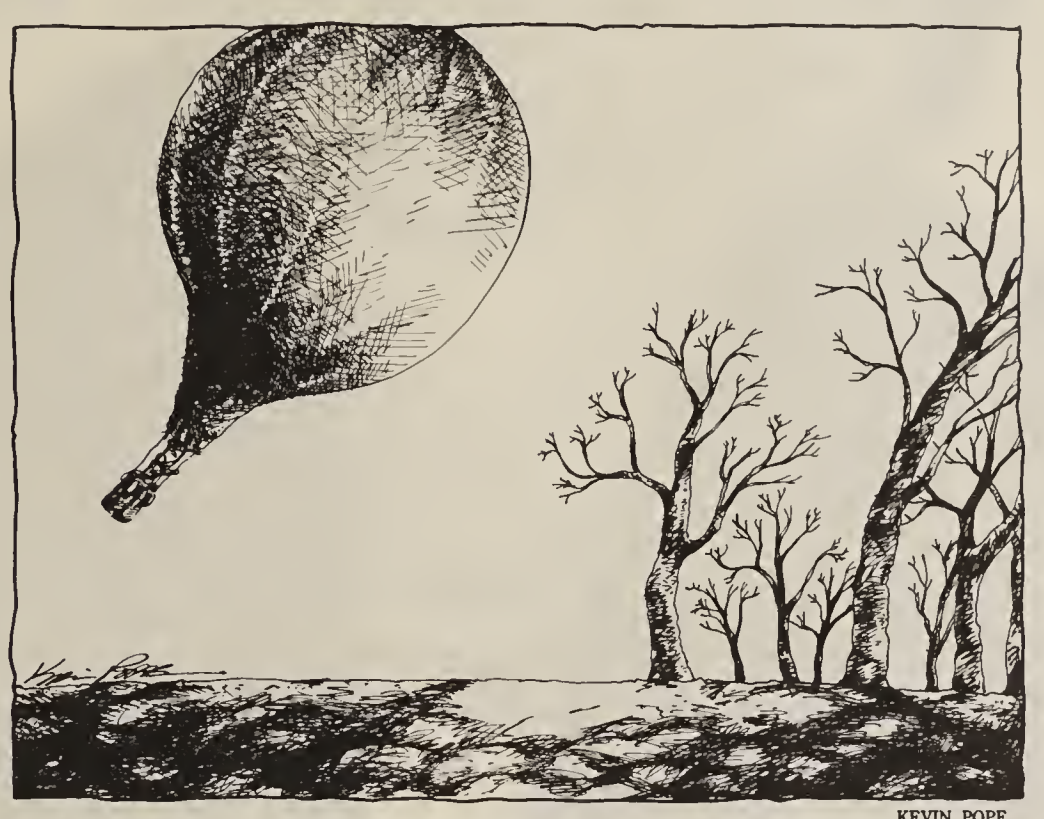
Not surprisingly, morale at DEC is down. "Morale is low everywhere, not just at headquarters," one high-level engineering manager says. "People are saying 'everybody is sitting around doing nothing' and are asking 'Why aren't the managers doing anything about this?' And someone else says, 'Because the managers don't have anything to do either.' "

"It feels different than the down period in 1983," says another longtime manager. "Financially, we are more healthy now. But people aren't leaping up to defend the company so quickly."

There's a feeling that the company isn't giving back what it should compared with what the employees are giving. There's a lethargy; people waiting for the company to make a move.

The feeling at DEC is that there is greater nervousness throughout the company now than during similar downturns in the past. "People are scared that this time, there really might be layoffs," one employee says.

Managers within the company, as well as outside observers, agree that DEC has at least 10,000 more employees than it currently needs. Despite that, there is unlikely to be a formal layoff. A lucrative employee-buyout program, which was offered to Salem, N.H., workers, will be offered elsewhere in manufacturing and in the field. According to a source inside DEC, the buyout plan will likely be offered to more employees before a layoff is ever instituted.



KEVIN POPE

The word at DEC is that last week's Aquarius announcement — DEC's high-end VAX 9000 mainframe — is a "make or break" product to pull DEC out of its malaise. "There's a certain amount of truth to that," says Terry Shannon, a DEC-watcher at International Data Corp. "Olsen is betting a substantial part of the future on this system's growth. It takes them into a new marketplace where there is formidable competition, but if they want their on-line transaction processor story to be a bestseller, they need an engine to run the system."

Whether or not Aquarius fulfills its promise, the short-term picture remains unclear for thousands of employees. The historical "family" feeling that is part of DEC's culture makes many feel that it is better to "spread the pain," as one finance manager puts it, rather than see selected people dismissed.

But the freeze on salaries, promotions and stock options, along with an un-DEC-like straitjacket on budgets for development projects, has wreaked widespread frustration. "There's no reason for the salary freeze," one employee says. "The company has

Continued on page 23

Rifkin is a *Computerworld* features editor.

1989 recession: Stop the stuff and nonsense

MARTY GRUHN

Let's face it, the computer industry is going into a recession — and in a big way. Each week, more vendors announce flat or falling sales, with the now requisite round of layoffs and early retirement programs. From the evidence, the computer industry seems to be under siege. The question is, of course, why?

History can be a most effective teacher in the computer industry, and this case is no exception. The last computer recession started in 1985 and lasted roughly through 1986. What is common with that recession and the one we see today? Both were triggered by a glut of computing power in organizations. And they were preceded by two years of stuff and nonsense from industry suppliers.

Gruhn is a consultant specializing in computer industry trends and strategies and founder of the Sierra Group.

By 1985, industry suppliers were coming out of a period where the battle cry was the power of the personal computer and the convergence of voice and data systems. AT&T was still trying to establish credibility in the computer business and was touting voice and data integration as the key to computing in the future.

THE PC EXPLOSION that fueled the computer industry in the 1980s is on the wane. That is why demand is down — and why vendors are going into a tailspin.

IBM was giving AT&T a headache through its acquisition of Rolm and had begun planting the suggestion that the telephone system should be managed by IS. While the industry giants squared off, other vendors stampeded into these supposed markets through alliances which produced innovative, but largely useless, technologies. In the midst of the melee sat the user who was happily recomputing his spreadsheets — and trying to figure out why the vendors had lost their minds.

What industry suppliers failed to appreciate was that everyone in corporate America already had a telephone on his desk and was not terribly interested in spending $3,000 for another. Those that needed a PC already had one, and most were disinclined to hook it up to the telephone system (for obvious reasons). In essence, the issue was whether this and other products of the day made any business sense. In retrospect, they did not, and the recession of 1985 was on its way.

No product better represents this era of insanity than the now defunct executive workstation, a smart terminal with an integral telephone. While positioned as a tool for executives to keep in touch with their busy organizations, its only real claim to fame was the ability to access stock quotes on a real-time basis and act like a second-rate PC.

In 1989, we are seeing the fruits of the same insanity. Vendors are trying to find creative ways to unlatch MS-DOS and its applications from corporate desktops to make room for new products whose real purpose in life is to refill the vendors' rapidly depleting coffers.

As an example, consider the noise levels surrounding such industry favorites as OS/2 and Personal System/2, EISA and Micro Channel, and a new flock of common user interfaces that require 4M to 8M bytes of memory on every desktop. Then we have client/server architectures and object management concepts that not even the techies can seem to define. While presented as the foundation products for a "brave new era in computing," the realities are still the same.

In today's market, these are solutions looking for a problem. Most users don't need them or want them, and they don't bring enough to the party to upset the status quo.

There is another glut in computing power in most organizations. Even those who don't need a PC have one, and most aren't terribly interested in spending $5,000 to reproduce what they already have. In a phrase, the PC explosion that fueled the computer industry in the 1980s is on the wane. That is why demand is down — and why vendors are going into a tailspin.

So, what are the messages for vendors in the future? First and foremost is the fact that new technologies will have to do a lot more than look pretty to be in demand. They will have to address real and pressing business needs before users will invest their hard-fought dollars. And, it is also clear that users aren't interested in playing the "technology turnover" games that fueled vendor fortunes in the past. Faster and cuter isn't enough when the price is backwards incompatibility. Users are interested in building on existing investments, not replacing them. That means a lot of these new mouse traps aren't going to attract any mice.

Finally, there is the question of when the recession of 1989 will end and when we will see a new and robust computer industry in the 1990s.

The answer is simple: The recession will end when vendors stop announcing stuff and nonsense and provide products that address real needs. Until then, the vast majority of corporate America will merrily compute on their existing resources. And industry suppliers will languish in the penalty box.

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Rifkin

FROM PAGE 21

plenty of money in the bank. There's a sense that the people at the top with all their stock and high salaries don't face the same hardships as the rest of us." Among clerical and administrative workers the pain is more acute because many are being shifted around involuntarily and genuinely fear for their jobs.

Olsen wants to pare down the work force by 10,000 at least, and he hopes it can be done through attrition. The fear at DEC is that the wrong people will end up leaving — the high-flyers instead of the deadwood. Some of that has already occurred in the workstation area and sales.

Adding to the concern is a sense that Shields' departure is a signal that incompetence will no longer be tolerated anywhere in the organization. Though no one will say outright that Shields was incompetent and therefore fired, it is no secret that Olsen was fed up with Shields' handling of sales and stripped him of his power base.

Breaking tradition

Traditionally, it has been difficult or impossible to be fired at DEC for anything less than criminal-type behavior. That policy has changed.

"The message is spreading that people will randomly get canned for incompetence," the high-level engineer says. "There are various ways to encourage people to leave."

Into the mix comes the feeling from longtime employees that DEC has lost the entrepreneurial spirit that fueled its impressive growth. "There are too many bean counters around now," one engineer says. "It's plain silly to cut everyone's budget across the board, but the bean counters have spread into every nook and cranny."

A management consultant to the company adds, "They have introduced too many bureaucratic processes, and they are now trying to undo them. They know the problem, and it's in their power to fix it. If they roll up their sleeves and go at it, they'll be all right."

Even in the gloom, there are pockets of light. Groups in which funded projects are keeping everyone busy and enthusiastic tend to remain optimistic. "A lot depends on where you are," one manager says. "The group I'm in is on the upswing so morale isn't quite as bad."

In these groups, there is a sense that some of the old style of DEC decision making may be returning. "The feeling is, don't wait for your boss's boss to tell you what to do, just go out and do it, take some risk," the manager says. "There's definitely an effort to reinstill that."

A management consultant who has observed DEC for more than 20 years suggests that DEC's current struggles are probably healthy. "Throughout its history, the company has always come out stronger from these periods," he says. "Ken Olsen's genius has always been his ability to spot a problem and do something about it. To him, this is not a crisis, but a normal problem-solving process."

Olsen's legendary status within DEC keeps him above the fray. He is still the "benevolent father" to most employees, except those high-level executives who know that he is up to his armpits in every DEC strategy decision.

Despite DEC's size, Olsen has managed to perpetuate the feeling among the rank and file that his door is open to everyone, no matter how trivial the problem. Though most employees don't actually try to get to Olsen personally, there is a feeling that "If Ken knew this was happening, he'd never let it continue." His very presence offers a stability that only the most hard-bitten DEC folk ever question.

Olsen is putting his vast influence to work in the sales organization. He has personally gone out to the field and started righting the sales ship. Word is that the sales force, with Shields gone and Olsen urging them on, is now pumped up.

If Olsen can, through sheer force of will, spread such enthusiasm throughout the rest of DEC, his legend should endure forever. It won't be easy this time.

At six o'clock this Wednesday evening, representatives of ten exceptional organizations will assemble to break bread together in New York.

They are banks, utilities and manufacturers. Aerospace, transportation and consumer products companies. Century-old corporations and firms with barely a decade behind them. Nevertheless they share overriding similarities.

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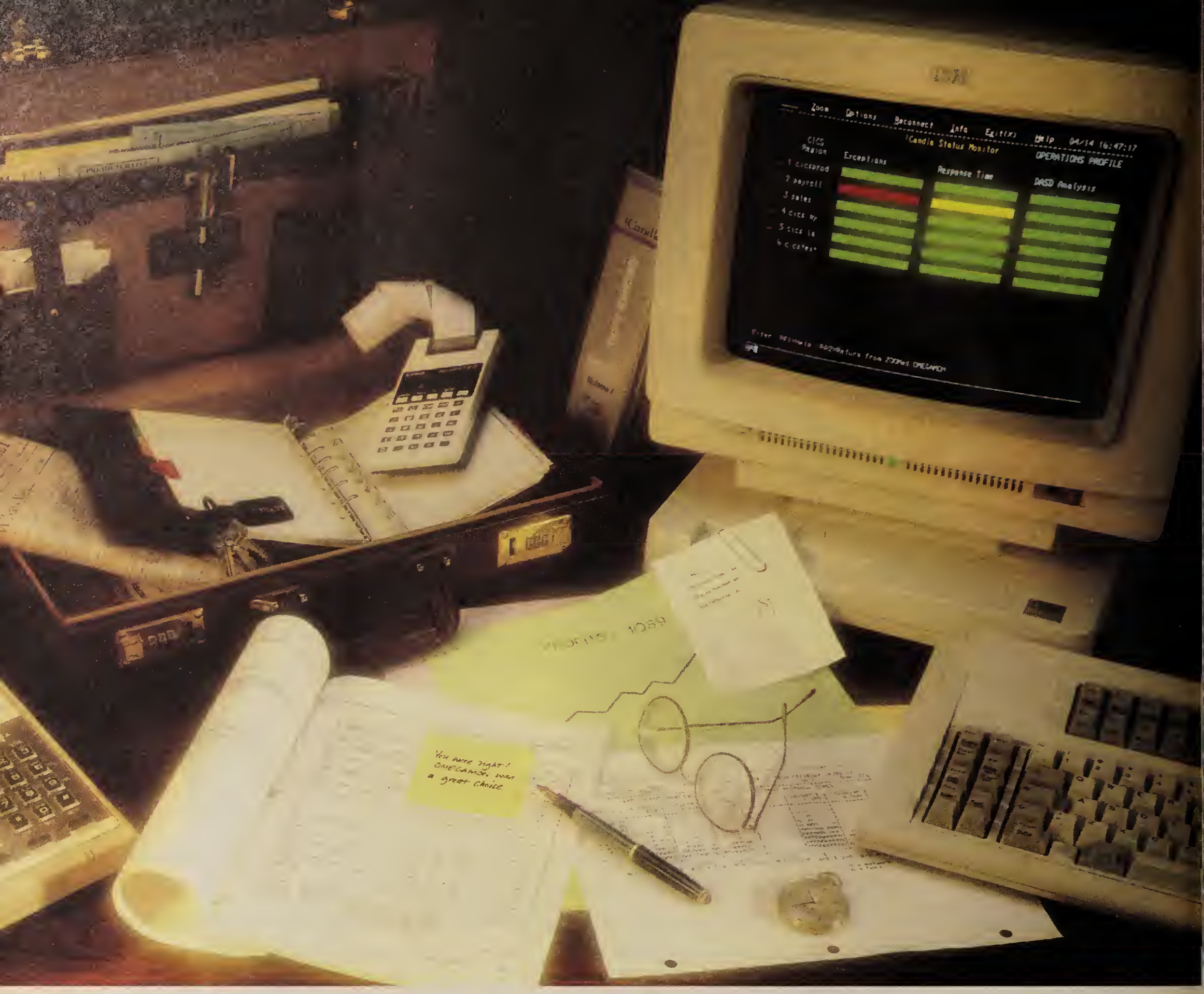

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SOFT TALK

Jean S. Bozman

Oracle amid change

If Oracle were to be viewed as a spiraling galaxy spinning in space, astronomers would be amazed to find the thing sprouting new spirals — and spinning faster and faster.

The new spirals would be the new independent business units (IBU), or divisions. In recent weeks, two IBUs were added: a network products division and a graphics products division.

In addition, the Macintosh division was combined with the PC products division — and both have been combined into the desktop products division. Altogether, there is now a total of 16 IBUs, according to the company.

How can users, including those who attended the International Oracle Users Group Week held in Dallas this month, keep track of all the changes? How can they be assured that their products will continue to get the same care and attention they did before Oracle began its skyward climb toward the $1 billion mark?

And yet the new structure of the corporation, like a rapidly spinning galaxy, could be vul-

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I/O generation gap lies ahead

ANALYSIS

BY J. A. SAVAGE
CW STAFF

Those futuristic commercials about the family being together at Thanksgiving through a big-screen phone hookup may not be all that far off — only we can't get there from here.

To get there, computers would have to have a new breed of chips that could handle enormous amounts of data but that would also be incompatible with today's processors.

While chips blossom that are hundreds of times more powerful in successive generations, their power is hampered by bandwidth and the ability to pass data from processor to processor, processor to memory, memory to peripheral and so on.

The new world of high-volume data transfer is recognized by several vendors, most of which are in reduced instruction set computing (RISC) architecture. Their problem — and their customers' problem — is that increasing bandwidth requires tossing the old and investing in the new.

To keep continuity between chip generations, bandwidth interface has increased only slightly. "Over the last 20 years, the number of events that can occur on a chip has increased 100,000 times, but interfaces are less than 10 times faster," said John Moussouris, a founder of Mips Computer Systems, Inc. who is focusing on increasing bandwidth at his own startup.

Moussouris said the appetite for increased bandwidth will be insatiable once media turns to digitized venues. Interactive video, high-definition television (HDTV) and digitized cinema cannot get a foothold without necessitating a chip design that is incompatible with earlier generations, according to Moussouris (see chart).

"The only way to reduce the pain [of incompatibility] is to get people to agree on standards," Moussouris said. "At least all the new chips will be compatible with each other."

In that endeavor, the Institute of Electrical and Electronics Engineers, Inc. has a committee, called P-1596, or the Scalable Coherent Interface Committee.

The committee is specifically working on a 16-bit-wide, 1G-byte bandwidth with 64-bit addressing, based on a 500-MHz signal. Conventional silicon will not be enough to drive it, said Michael Mahon, manager of client/server architecture at Hewlett-Packard Co. He said it will need emitter-coupled logic or BiCMOS technology, with those being possibly coupled

Continued on page 34

How much is enough?

Different communications functions require different bandwidths:

- Digital phone: 64K bit/sec.
- Audio CD: 1.5M bit/sec.
- HDTV (noncompressed): 1G bit/sec.
- Cinema, 70mm high-quality: 100G bit/sec.
- Computer generation of cinema: 100 trillion bit/sec.

4GL developers turn to distribution

BY ROBERT MORAN
CW STAFF

Two fourth-generation language developers — Information Builders, Inc. and Must Software International — have sketched plans to prepare fourth-generation languages for distributed processing in the early 1990s.

According to IBI, its move toward a distributed systems application architecture will require a redesign of Focus into an object-oriented 4GL.

Achieving the goal, however, requires developments within several other parts of the Focus architecture, which the company said it will tackle in phases.

In phase one, IBI will offer cooperative processing between the workstation and the mainframe. According to John Senor, manager of corporate marketing, the company's communications software, Focnet, will offer users a choice between LU6.2 and LU2 communications protocols in the first quarter of 1990, with product availability shortly thereafter. At present, Focnet for IBM mainframe-to-DEC VAX connections is available for $16,000.

In the same time frame, the company will deliver its Application Control Environment (ACE) — a distribution library that will contain a catalog of users and servers authorized for particular applications, Senor said.

According to the company, ACE will be delivered in the first quarter of 1990 and will cost between $16,000 and $19,200.

Part two

In the second phase, the company will extend Focnet beyond LU6.2 to embrace other environments such as Transmission Control Protocol/Internet Protocol. The extensions will be announced in the second quarter of 1990, with product availability shortly after, Senor said.

Although Focus has been running successfully on numerous individual platforms, it has lacked components that will tie these platforms together, said Chris Bell, a systems programmer at British Airways in London and president of both Fuse International and Fuse UK, the Focus user groups.

"Companies with large investments in Focus will be able to distribute their applications in a way that takes advantage of the features of the different platforms that it runs on," he said.

The dividing line between the

Continued on page 38

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A Comparison Chart of the Major Cooperative Processing Software Products:

Functions:	SUPER-LINK® Family	Easel™	Mozart™	Arbiter®	IBM's HLLAPI	IBM's APPC™ or CPI-C™
Processing Topologies Supported						
SAA CUA Interface for existing 3270 applications:						
Under PC/DOS	Yes	No	No	No	No	No
Under OS/2	Yes	Yes	Yes	No	No	No
Transition from PC/DOS to OS/2	Yes	No	?	No	No	No
3270 Communications	Yes	Yes	Yes	No	Yes	No
Peer-to-Peer Communications:						
for extending existing 3270 applications	Yes	No	No	No	No	No
for new applications	Yes	No	No	Yes	No	Yes
Maintenance of PC applications & data from a central library	Yes	No	No	No	No	No
Background file transfer in PC/DOS	Yes	No	No	No	No	No
Background peer-to-peer processing in PC/DOS	Yes	No	No	No	No	No
Object Orientation	Yes	Yes	No	No	No	No
CASE/Application Generation	Yes	No	No	No	No	No
SAA CUA Support						
All functions supported on PC/DOS:	Yes	No	No	No	No	No
Action Bar	Yes	*	Yes	No	No	No
Pull-down menus	Yes	*	Yes	No	No	No
Pop-up menus	Yes	*	Yes	No	No	No
Messages and Prompts	Yes	*	Yes	No	No	No
Dialog Boxes	Yes	*	Yes	No	No	No
Forms	Yes	*	Yes	No	No	No
Direct support for multiple levels of action bars and pull-downs	Yes	*	No	No	No	No
Action bars and Pull-downs in a form	Yes	*	No	No	No	No
Single and multiple selection menus	Yes	*	No	No	No	No
Menus and Lists within a form	Yes	*	No	No	No	No
CUA defined help	Yes	*	No	No	No	No
Development System Features: available without programming						
Field-level context-sensitive help	Yes	No	Yes	No	No	No
Optional learning mode (help always displayed)	Yes	No	No	No	No	No
Embedded User Assistance (pop-up selection lists)	Yes	No	No	No	No	No
Dictionary for storage and re-use of definitions & documentation	Yes	No	No	No	No	No
Data Editing/Validation:						
Data type/mask checking	Yes	No	Yes	No	No	No
Range/limit checking	Yes	No	No	No	No	No
Date formatting/checking	Yes	No	No	No	No	No
Validation against database files	Yes	No	No	No	No	No
Required fields	Yes	No	No	No	No	No
"Must Fill" fields	Yes	No	No	No	No	No
Zero not valid fields	Yes	No	No	No	No	No
Multiple validation points during PC processing of transaction form	Yes	No	No	No	No	No
Complete local application testing, database maintenance, interface						
testing, and mainframe communications simulation	Yes	No	No	No	No	No
Language Objects Available Without Low Level Programming						
Display and selection from:						
In-memory lists	Yes	Yes	Yes	No	No	No
File lists	Yes	No	Yes	No	No	No
Database lists	Yes	No	Yes	No	No	No
Menu display and selection	Yes	No	Yes	No	No	No
Help at all levels: (Panel, Action bar, Menu, Form, & Field)	Yes	No	Yes	No	No	No
Error Processing	Yes	No	Yes	No	No	No
Add/update/delete/locate on:						
Sequential files	Yes	Yes	Yes	No	No	No
Database files	Yes	No	Yes	No	No	No
Host logon sequence	Yes	No	No	No	No	No
Determining 3270 screen identification	Yes	No	Yes	No	No	No
Read/Write all fields on 3270 screen with a single command	Yes	No	No	No	No	No
Determine dynamic 3270 field attribute changes	Yes	No	No	No	No	No
Dynamic modification of field attributes based on form entries						
Initial values displayed	Yes	No	No	No	No	No
Protected/unprotected fields	Yes	No	No	No	No	No
Development Environment Comparison						
Object Orientation	Yes	Yes	No	No	No	No
Dictionary and documentation	Yes	No	No	No	No	No
Panel/Form painter for Creation/Maintenance	Yes	Yes	Yes	No	No	No
3270 screen capture: Picture and attributes	Yes	No	No	No	No	No
Application Generation (CASE)	Yes	No	No	No	No	No
Intelligent editor (language sensitive)	Yes	No	No	No	No	No
System/user defined templates	Yes	No	No	No	No	No
Integrated compile/test/debug	Yes	No	No	No	No	No
Keyboard re-mapping	Yes	Yes	Yes	No	No	No
Compiled environment	Yes	Yes	Yes	No	No	No
Execution-time source debugging	Yes	Some	No	No	No	No
Host Environments Supported for Peer to Peer						
MVS - CICS	Yes	No	No	Yes	No	No
MVS - IDMS/DC	Yes	No	No	No	No	No
MVS / TSO	Yes	No	No	No	No	No
DOS / VSE-CICS	Yes	No	No	Yes	No	No
VM / CMS	Yes	No	No	Yes	No	No
DEC VAX / VMS	Yes	No	No	No	No	No
Minimum PC Hardware Requirements: IBM XT / Clone, 640k	Yes	Yes	Yes	Yes	Yes	Yes

*Easel does not support the SAA CUA style interface under PC/DOS only under OS/2.

Every effort to present an accurate chart has been made, however no guarantee can be made (8/7/89). Super-Link® is a registered trademark of Multi Soft, Inc., Lawrenceville, NJ., Mozart™ is a trademark of Aspen Research. Easel™ is a trademark of Interactive Images, Inc. Arbiter® is a registered trademark of Tangram Systems.

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IBM Business Partner

Banking on a CASE project

Huntington National's Customer Information System becomes its hub

ON SITE

BY SALLY CUSACK
CW STAFF

COLUMBUS, Ohio — When a major company is switching mainframe vendors, building a new data center and converting existing software applications, the last thing the IS manager wants to do is break ground on a computer-aided software engineering (CASE) project.

But Huntington National Bank in Columbus, Ohio, with $10.2 billion in assets, did just that, and according to John Voss, vice-president of systems integration, so far it seems successful.

When the systems overhaul is completed in mid-1990, the bank expects to have built a foundation allowing the bank to move forward in a more timely manner and solve business problems more quickly with regard to both packaged software and internal development.

Software advantage

About three years ago, Huntington — which had been running systems from Unisys Corp. predecessor Burroughs Corp. for nearly a generation — decided to take its 1.4 million accounts and house them in a new data center on an IBM 3090 Model 300E mainframe to take advantage of the greater availability of software for IBM environments.

While Voss and his team were painstakingly pounding out a conversion strategy comprising off-the-shelf conversion packages and specially licensed conversion software products, they certainly were not looking to undertake a CASE project. But in the dust of the conversion work the possibility surfaced.

With an eye toward enhanced customer service, the bank decided to create in-house software tailored to its customer needs. This required an integrated method for handling customer accounts and information. The goal was a comprehensive customer account profile, including client demographic information and data on multiple accounts, to be produced on a single screen and a single statement.

Huntington's Voss *was not looking to try CASE*

Early in 1988, Arthur Young was hired as a technology and methodology consultant and eventually suggested Knowledgeware's Information Engineering Workbench (IEW) for the project's initial data analysis and modeling platform.

"As we moved further down the road we asked ourselves, 'What comes after analysis?' " Voss recalls. "We wondered if it was possible to do automated code generation out of analysis. We looked at Knowledgeware's Gamma back-end generator and realized it was not interfaced, let alone integrated, with the IEW front-end generator."

It was then that Voss remembered hearing about a CASE tool offered by Texas Instruments, Inc., the Information Engineering Facility (IEF). He contacted TI, half hoping that nothing would come of the presentation and the CASE issue would die. The presentation went well, however, and Voss admits that he felt obligated to request a product demonstration.

In March 1988, Voss' staff spent two weeks building a prototype of their Customer Information System (CIS). Pleased with the outcome, Huntington committed to the project.

IEF is an integrated set of CASE tools that generates program code, databases and systems documentation automatically. The product reportedly permits systems analysts to design the systems via diagrams developed on computer workstations. System code is generated automatically from the diagrams. According to Voss, TI remained on-site in Columbus through October 1988 to provide training and support.

The bank is running the CIS system under IBM's DB2 Version 2.1. The database runs online, 24 hours a day in an MVS/ESA environment and handles data access in both online and batch modes, Voss said. While referring to CIS as the "hub of our application system," Voss notes that a decision was made to keep a Unisys machine for check processing, and the bank opted to become one of the first users of the Unisys image processing system announced last month. A Unisys V-580 machine recently arrived for that purpose, so in effect, the bank will be running in a dual environment.

The overall conversion process is about 90% complete. The larger applications, such as demand deposit, took four months to convert, Voss said, adding that applications ran parallel on the IBM and the old Unisys B-4955 systems for several months as part of the testing process, beginning in late 1986.

There are now 1,200 users on the CIS system, and the CASE investment has apparently paid off. The system has been very reliable, Voss said. "Our transaction productivity has increased. When changes have been necessary, which is seldom, we simply revise the IEF diagrams and automatically regenerate the code."

FPS rolls out enhanced minisupercomputers

BY ROSEMARY HAMILTON
CW STAFF

BEAVERTON, Ore. — FPS Computing will roll out a new version of its minisupercomputer today, targeting it straight at Convex Computer Corp.'s offerings.

FPS also plans to introduce both a disk drive subsystem and tape subsystem for its Model 500, based on Expandable System Architecture (EA).

The Model 500EA is said to offer up to 2.5 times the performance of FPS' existing system, the Model 500. The Model 500EA will start at $204,000, but a typical configuration will cost about $421,000, the company said.

The main differences between the Model 500 and 500EA are a vector processor, which brings the performance boost, and a modular architecture, which allows users to plug in systems components as the need arises.

Same RISC

The system is based on the same proprietary reduced instruction set computing (RISC) processor that is used in the Model 500. The company is keeping an eye on RISC market developments and could likely move to one of the emerging RISC chip standards in the future, according to Carolyn McClain, an FPS senior product manager. She said FPS has no immediate plans to make a commitment to a RISC chip.

As with the Model 500, users can add up to four processors, either scalar or vector.

FPS said it has begun shipments of a modified Model 500EA that includes the vector processor. It will start shipping a full-blown system, which includes a new enclosure and backplane to accommodate the modular architecture, in the first quarter of next year.

Model 500 users can upgrade to the system by purchasing an enclosure and backplane for about $80,000, McClain said. Existing Model 500 components can then be plugged into the system, she added.

The company plans to offer a disk subsystem that has a transfer rate of 6M byte/sec., which is twice as fast as the current subsystem.

The 200 in./sec. tape subsystem will work with IBM 3480-compatible tape cartridges, the company said.

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Bozman

FROM PAGE 25

nerable to centrifugal forces at its farthest points. Some of Oracle's star products could spin out of control and lose their connection with the stable center. Many of the 3,600 users who attended the users meeting say they already have to keep a sharp eye on products to monitor their trajectory through enhancements, fixes, patches and changes. Even the older products, such as Oracle Version 5.0, are continually being patched as new bugs are found. User special-interest groups can attest to that fact.

At this rate of change, cynical observers might predict a supernova somewhere down the line. But Oracle Chief Executive Officer Larry Ellison and Peter Tierney, senior vice-president of Oracle's systems products division told reporters and analysts attending a briefing session here that two key oversight committees will keep things from spinning out of control.

A product management committee, headed by Chief Financial Officer Jeff Walker, takes a look at emerging products to make sure they all fit with the core Oracle product, the Oracle DBMS, Tierney said. The committee of six includes Ellison, Tierney and Oracle co-founder Bob Miner.

Since the product management committee reviews each division in turn, individual IBUs are "cycled through" the oversight process once per quarter, Tierney said. Moreover, Tierney said, an architectural committee "meets weekly to review IBU products to see if they fit into the overall schema of what we want to do." The architectural committee reports directly to Ellison.

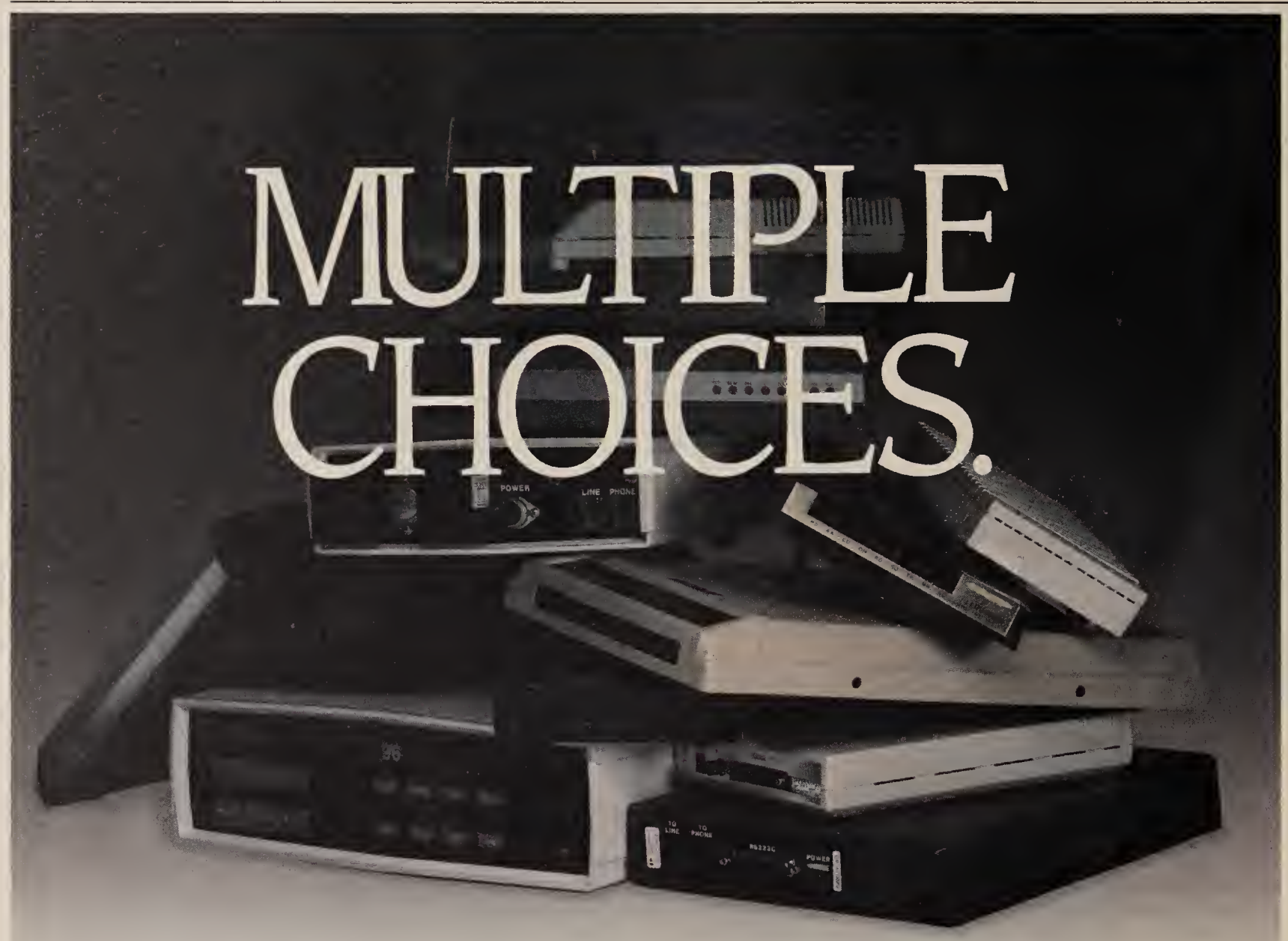
Quality, Ellison said here, is something Oracle does not want to lose, no matter how fast his 12-year-old company pushes past its current mark of $800 million in revenue. The IBUs were formed last fall, Tierney explained, to accommodate Oracle's rapid growth, which is being pushed by the starship-like warp drive of Oracle's marketing and sales forces.

The analysis of Oracle's top managers, it seems, is that software writers are more productive in smaller working environments. In software, less is more.

So it is with elegance in software design — something Oracle would like to believe it is achieving. "The question was how to forestall the growth of a bureaucracy as we grow to a $1 billion company," Tierney told the analysts. "The question is, how do you embrace that growth and not inhibit it?" The answer, it seems, is the modular IBU structure.

As Oracle pushes into new sectors of the software universe — including a dramatic reach into financial and manufacturing applications software — one can only hope that those policy and architectural committees have a firm hand on the Oracle tiller and can make midcourse corrections, if necessary.

Bozman is *Computerworld's* West Coast bureau chief.



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NEW DEALS

Unisys nails down two

Northern Trust Co., a financial institution based in Chicago, is planning to purchase a payment system from **Unisys Corp.**

The system will include a Unisys V380 mainframe, DP1800 reader/sorters as well as the Unisys Item Processing Systems software, which is used for check processing.

Northern Trust Co. is a subsidiary of Northern Trust Corp.

Unisys also sold a $1.5 million mainframe-based system to Sonneveldt Co., a wholesale food distributor based in Grand Rapids, Mich.

The system, based on an A12 mainframe, will be used to link Sonneveldt to its retailers, which are, for the most part, fast-food restaurants and delicatessens. With the use of desktop systems, the retailers can place orders for food supplies directly from Sonneveldt.

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HDS

Hitachi Data Systems

DG bares teeth to mini rivals, shows client base a loyal face

BY MARYFRAN JOHNSON
CW STAFF

WESTBORO, Mass. — As Data General Corp.'s latest entry in the minicomputer price/performance wars, the new Eclipse MV/18000 could be both a comfort and a cantankerous competitor.

It may be a comfort for some 2,200 owners of older MV/15000s, who can now move to a cheaper but more powerful machine with fully compatible architecture. It may be a competitor for both IBM's Application System/400 Model B50 and Digital Equipment Corp.'s VAX 6000 Model 310, which DG claims are 30% to 83% more expensive, respectively, than the MV/18000.

In three models priced from $73,000 to $139,000, the MV/18000 is a fill-in-the-line product for DG, industry analysts said. The company also announced two new disk subsystems providing from 1.2G to 9.6G bytes of storage.

"Data General's installed base should feel comfortable; the company is putting resources into the MV technology and not making it an orphan," said Byron Walker, an analyst at Moody's Investor Service in New York.

"The 18000 is a perfect example of an in-between machine. It's a fairly good strategy to show their commitment to the client base," agreed Carolyn Griffin, an analyst at International Data Corp. in Framingham, Mass. "I firmly believe DG has a good handle on their strategy," Walker said. "But with everybody moving toward RISC now, what kind of margins will there be on these [RISC] products? The real margins are in the proprietary lines."

"Data General has come a long way in a short time," said Clifford Allmon, director of MIS at Memorial Hospital in Chattanooga, Tenn. "Only months ago, DG was in trouble, and everybody was shying away from them. But I felt like they were going to come out of it, so we pursued the orders we had."

The hospital just upgraded its three MV/8000s with installation of three MV/15000s.

Excited about upgrading

Allmon said he was excited about the MV/18000 because of the upgrade paths for memory and storage, but he lamented the $176,000 price tag on each of the older MV/15000s. "I could have bought two of the 18000s for that," he said.

The MV/18000 Model 1 is a uniprocessor machine packing 4.4 million instructions per second (MIPS) and priced at $73,000.

IDC's Griffin said the company was unwilling to provide benchmark comparisons between the new machine and its competitors.

The Model 1 base system includes 8M bytes of memory. The $139,000 Model 2 is a dual-processor box rated at 8.5 MIPS and includes 16M bytes of memory.

The SX base system model is a Model 1 configured with a floating point unit and costs $77,500.

The 1.2G-byte Model 6621 Rapid Access Mass Storage disk subsystem, priced at $35,300, offers more than double the storage capacity of the existing Model 6581. It is scalable in 1.2G-byte increments up to 9.6G bytes.

I/O gap

CONTINUED FROM PAGE 25

with fiber optics.

Because the bandwidth group is addressing a future need rather than fixing up the current bus technology, the politics of business may slow product introductions. HP, for instance, has a group working on a "future bus" based on conventional design but altering voltage swings. "They were concerned they'd be headed off at the pass," Mahon said. "The standards [committee] has cooled a bit in the last year."

The committee's main problem is addressing the "scalable" process — to make sure that multiprocessor design can increase bandwidth with each additional processor, according to Moussouris.

"It's not so much exotic high tech as just good judgment that people can agree upon," Moussouris said.

Focus on processors

The committee is focusing on processors, rather than dynamic random-access memory (DRAM), as there are fewer RISC processors in use, which allows more flexibility. To try to change DRAMs at this point would cancel out too much of an investment, although memory bandwidths would have to be addressed at some point.

In fact, each part of the computer should be addressed on the bandwidth level. "If there are 10 different places in the system to increase bandwidth and only nine of them are increased, you'll still have a bottleneck," Moussouris said.

Moussouris expects high-bandwidth chips available before the mid-1990s. "But their acceptance is more of an issue of market penetration than availability," he said.

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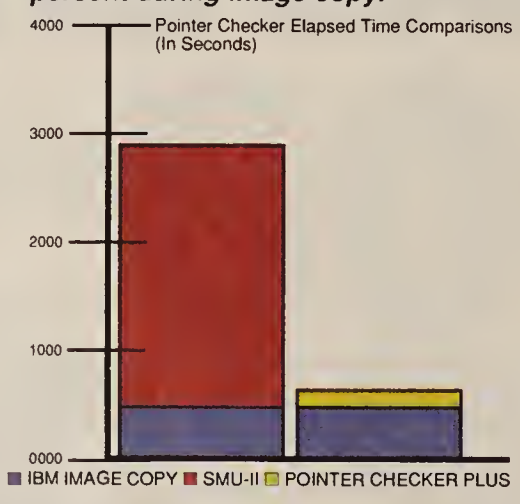

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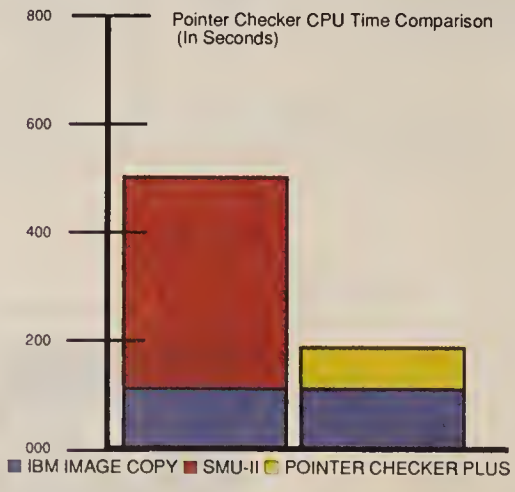

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FROM PAGE 25

first two stages and the third stage will be a complete rearchitecture of Focus into an object-oriented language.

"The objective is to deliver interoperable systems in which any application on any server will be interoperable with any server on any other machine," Senor said.

According to the company, it will announce and deliver an object-oriented Focus in the first quarter of 1991, including universal communications capability within Focnet and object servers — databases that will reside on each platform and contain the executable objects.

While IBI has been aggressively broadening the types of processors it claims will be able to participate in its distributed framework, Must Software said that it is "out of the processor wars" and is restricting itself to Digital Equipment Corp. and IBM Systems Application Architecture platforms.

Must Software calls its move to distributed processing Nomad Vista. According to John Crocker, vice-president of product planning, Must Software aims to bring to the applications developer the same degree of transparency available to end users today.

According to Crocker, the developer will be able by 1992 to split the application down to a functional level where certain functions execute on the workstation while others execute on the midrange or the mainframe. "The person developing the application won't need to worry about where the application will reside," Crocker said.

However, like IBI, Must Software will roll out its offering in phases. In phase one, Nomad will allow a workstation to access remote databases without needing programs at the remote site or the user needing to know whether the site is a local-area network, an IBM mainframe or remote VAX, Crocker said.

Toward that end, in the second quarter of 1990, it will deliver PC Nomad for LANs, comply with IBM's Common User Access and offer an OS/2 version. PC Nomad costs $795; the new release will cost $1,195, Crocker said. In addition, Nomad will support DEC's relational database in the third quarter of 1990, with prices increasing by 33%.

In the first half of 1991, the company will also support access to the IBM Application System/400. In the second half of 1991, Nomad will run on the AS/400.

Must user Lloyd Erickson, an electronics engineer in the data processing systems division at the Johnson Space Center, said cooperative processing would dramatically reduce response time.

"Every time we send a command to the mainframe, it requires three or four seconds to cross the network, even if it is trivial," Erickson said. "With a PC you can have things flash right in front of you almost as fast as you can push the buttons."

NEW DEALS

Sequent signs $1.3M deal

Sequent Computer Systems, Inc. and **CLSI, Inc.** announced a $1.3 million deal with the Pasco County school board in Pasco County, Fla. The school board plans to automate the school district's 40 libraries with a Sequent Symmetry-based system. CLSI will provide the software for circulation control, cataloging and purchasing. The four-processor Symmetry will support about 200 terminals.

Intellisys, Inc. in Syracuse, N.Y., plans to use a **Harris Computer Systems Division** computer for work on its proposed design of the U.S. Navy's Command Team Trainer (CTT). The Harris system is a Night Hawk 3000 real-time computer with eight Motorola, Inc. MC68030 processors.

CTT is a training system designed to simulate both the equipment and the human decision-making process involved in military missions.

NEW PRODUCTS — SOFTWARE

System software

Advanced Systems Concepts, Inc. has announced its Remote Queueing Extended (RQE) Version 1.0 package for Digital Equipment Corp.'s VAX Decintact TP monitor and IBM's CICS transaction processing system.

RQE was developed to provide a seamless, transparent approach to resource sharing between DEC and IBM transaction processing systems, according to the vendor. The product is said to communicate by using Systems Network Architecture LU6.2, the firm said.

RQE/VMS provides DEC VAX programmers with transparent access from Decintact queues to and from CICS Transient Data Sets.

It is priced from $10,000 to $35,000, depending on CPU. RQE/CICS reportedly uses a conversational interface for system management and is priced from $35,000 to $50,000, depending on CPU platform.

Advanced Systems Concepts
33-41 Newark St.
Hoboken, N.J. 07030
201-798-6400

Applications packages

Arthur Andersen & Co. has announced Cell-Pac, a computer-integrated manufacturing (CIM) software package that manages the execution of a manufacturing shop floor plan.

The product was reportedly designed to operate either as a stand-alone cell controller or in conjunction with factorywide systems. The software reportedly performs such functions as scheduling and dispatching of work, resource control, monitoring of machine status and quality control. According to the company, the program is hardware-independent and written in C language to run under Unix System V Version 3.0.

Pricing begins at $50,000 per copy.

Arthur Andersen
33 W. Monroe St.
Chicago, Ill. 60603
312-580-0033

J.L. Computer Systems, Inc. has released Version 5.0 of its Business Software packages for Digital Equipment Corp. VAX computers running under VMS.

Enhancements reportedly include window processing with selection menus and pop-up displays, an on-screen adding machine for numeric and dollar entry field calculations, and data entry.

The integrated system also is said to include a base module, accounts-payable and accounts-receivable, general ledger, payroll, inventory and a variety of other applications.

The software is offered through distributors and dealers as licensed source code, the company said. The suggested retail list pricing ranges from $2,640 to $7,200 per application package, depending on hardware platform.

J.L. Computer Systems
3403 Lancaster Ave.
Wilmington, Del. 19805
302-998-8030

Information Science, Inc. has released Comply/89, a human resources management system that reportedly has been designed to help companies meet the federal requirements of Section 89 regarding corporate benefits programs.

The system works in an IBM mainframe environment using existing data from various sources, including third-party human resource software, the company said. The stand-alone version is said to include both a high-speed data entry module that uses IBM 3270 terminal or personal computer emulation devices and a generalized analysis/reporting tool.

License options vary depending on the user's current system. For example, users of TSI International's Key/Master can license the product for $2,000 to $5,000, depending on the IBM processor used.

Information Science
95 Chestnut Ridge Road
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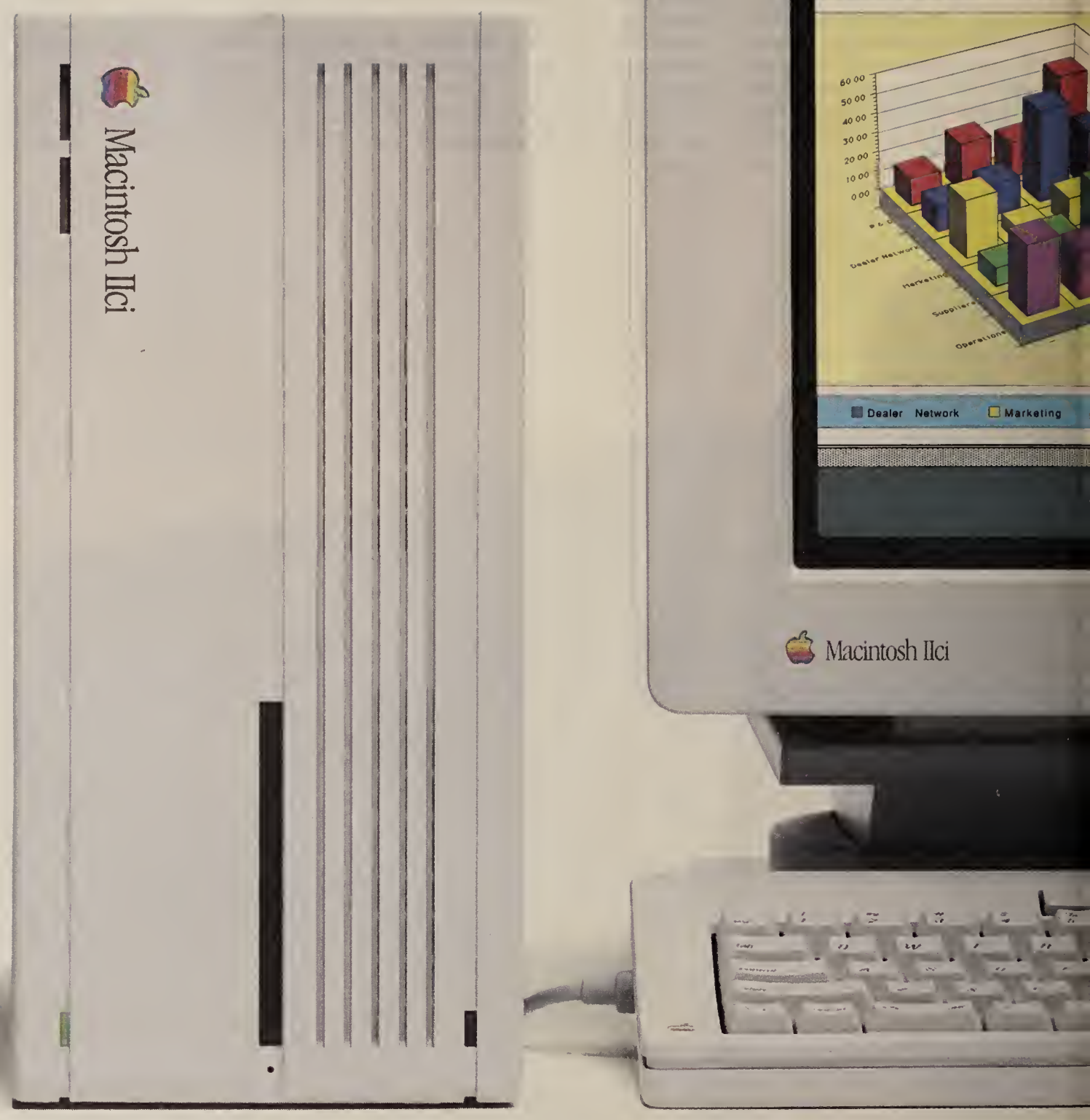

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MICRO BITS

Patricia Keefe

Ease away from EISA

'Put a lid on it.' A Texas source reports that Compaq's board of directors delivered that message to founder Rod Canion recently on the subject of Extended Industry Standard Architecture (EISA). Seems Canion and company were spending so much time boosting EISA, there was some concern that Compaq was becoming too identified with it. The fear here was that if EISA fails to grab buyer interest, it will reflect particularly badly on Compaq.

Canion reportedly was told to get moving on an internal Micro Channel Architecture (MCA) box — just in case. Of course, Compaq is planning a big splash with its Intel I486-based EISA boxes next Monday, and that MCA box may nev-

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Inside

- Home Express uses SQL to generate customized merchandise reports. Page 43.
- FM service feeds news-hungry executives. Page 43.
- I486-based hardware blitz will be here soon. Page 45.

Next business software up next

ANALYSIS

BY JAMES DALY
CW STAFF

Business software developers have given plenty of lip service to Next, Inc.'s splashy hardware package, but deliverable corporate applications have so far been harder to find than vegetarians at a wienie roast.

That imbalance is finally expected to change over the next four months, as more and more business software developers host coming-out parties for Next-oriented applications, according to a spokesman at Businessland, Inc., which distributes the machines.

"We're looking at lots of spreadsheet packages as well as word processing and front-end database applications," said Kevin Compton, director of advanced systems at the San Jose, Calif.-based computer retailer.

Developers interviewed recently said the arrival of the Next operating system in mid-September gave them a real-life yardstick against which to measure their product and hence has moved up release dates.

Despite the assurances, however, analysts warn users not to expect a broad and deep selection of software for the corporate market for the next six months to a year. "Software takes a long time to write, especially if developers intend to fully exploit all of the Next machine's potential," said Amy Wohl, president of the Bala Cynwyd, Pa.-based Wohl Associates research firm. Wohl added that the availability of such applications is critical to the company's long-term success in much the same way the availability of popular records will drive up the market for stereo systems.

Cash flow grows

Next officials said they hope to ship 3,000 to 5,000 machines this year and are tapping into the academic market for much of Next's cash flow. Meanwhile, deep-pockets investors such as Canon, Inc. have poured more than $100 million into the Redwood City, Calif., firm.

Since Next's introduction a year ago, the innovative engineering performance of Next President and Apple Computer, Inc. co-founder Steve Jobs has kept developers' tongues wagging. "They've finally married the power of Unix to an accessible user interface," said Rick Davis, director of product marketing at Frame Technology Corp., which shipped a Next version of its Framemaker 2.0 publishing software earlier this month.

Most of the converted say they are sold on the machine's sexy technologies, including the use of erasable optical storage

Continued on page 48

Expert system chip may ease integration

BY ELLIS BOOKER
CW STAFF

A microchip specifically designed for expert system applications on personal computers and workstations has been developed by custom microprocessor maker International Chip Corp. (ICC) in Columbia, S.C., and Ricoh Corp. in West Caldwell, N.J.

One analyst said development of the chip may be a step toward more closely integrating expert system applications with mainstream computing.

In an unrelated announcement, ICC said it has developed an applications development tool kit called the Rule Compiler, which ICC President and CEO Tai Sugimoto claimed is easier to use than standard artificial intelligence languages such as LISP and Prolog.

"Our target audience, commercial users, have had to depend on knowledge engineers or programmers to create applications," Sugimoto said. "Our compiler allows the subject matter expert to build applications by following [a series of] prompts."

Sugimoto said the Rule-Based Expert (Rex) very large-scale integration chip can process 1.67 million "if-then" rules per second in a test, assuming one condition and one action per rule. The company claimed that is 50 to 100 times faster than existing commercial chips such as Intel Corp.'s 80386.

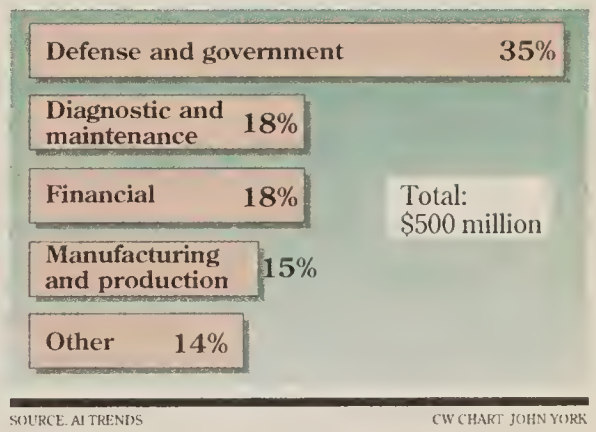
Normally, expert systems are developed in software and feature two components: an "inference engine" composed of "if-then" rule sets and a "knowledge base" of subject-specific data. The Rex chip is the first chip to contain the inferencing mechanism, Sugimoto claimed.

"In a Rex chip, only the needed micro-instruction set is used," said Sugimoto, who added that these instructions are the equivalent of four to six sets found in general-purpose chips. The Rex board itself provides a storage capacity of more than 21,000 customized rules.

Continued on page 45

Mixed bag

Defense and government applications represent the biggest chunk of the worldwide expert system market



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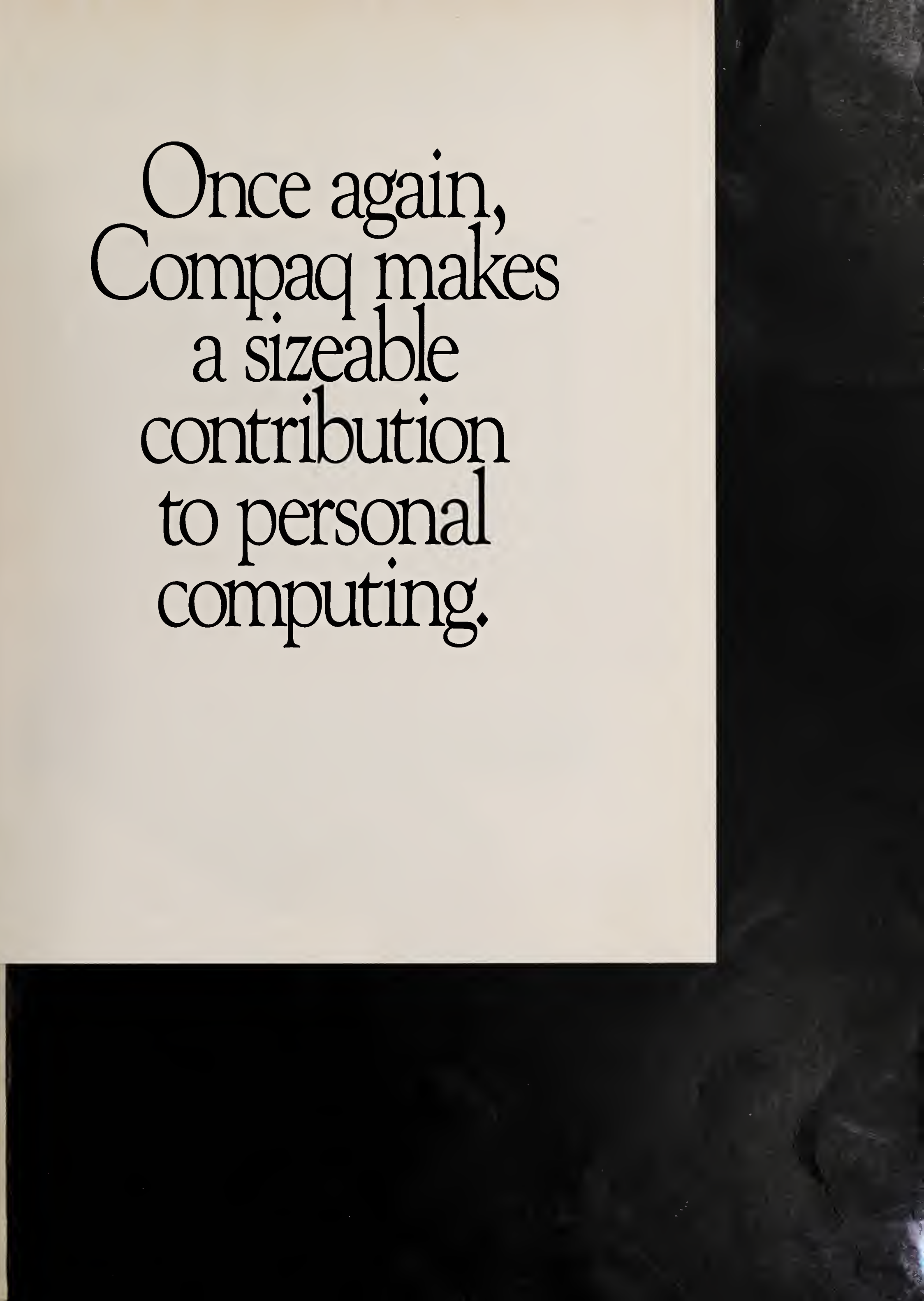
Once again, Compaq makes a sizeable contribution to personal computing.



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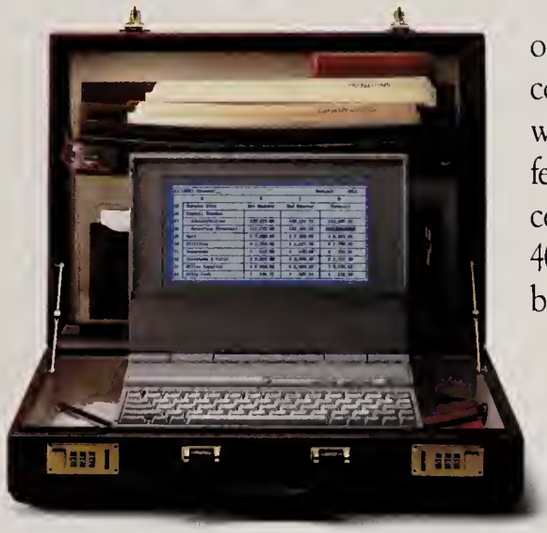

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A 3½-inch 1.44-MB Diskette Drive lets you run your MS-DOS office software when your office is on the road.

All this runs for more than 3½ hours on a small, yet very powerful battery pack. Recharging is fast, and changing to a spare is easy. You can even run your PC off AC power, or from your car's cigarette lighter with an optional adapter.

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The COMPAQ LTE/286 is designed for business professionals who need extra performance on the road. For spreadsheets and cost analyses, account profiles, as well as word processing and E-mail. It features a 12-MHz 80C286 microprocessor, a choice of a high-performance 40- or 20-MB Fixed Disk Drive and a built-in 3½-inch 1.44-MB Diskette Drive.

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The COMPAQ LTE is for people in the field who need basic computing capabilities. For inventory tracking, customer databases, custom and standard business applications. It's ideal for automating a sales force. It has a 9.54-MHz 80C86 microprocessor and a 3½-inch 1.44-MB Diskette Drive. You can add a 20-MB Fixed Disk Drive and expand its 640K memory to 1 MB.

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COMPAQ

It simply works better.

Retail strategy banks on SQL

ON SITE

BY RICHARD PASTORE
CW STAFF

HAYWARD, Calif. — To better manage merchandise movement, the retail industry has increasingly exploited such devices as handheld data-entry machines and point-of-sale systems.

Now, a 12-store housewares and electronics chain has implemented an innovative system that melds SQL Server and spreadsheet software capabilities to provide user-customizable merchandise reports.

Users at Home Express, Inc. headquarters here can for the first time generate customized merchandise research reports simply by manipulating and ranking store sales data within the familiar parameters of Microsoft Corp.'s Excel spreadsheet program.

The brain behind the setup is the Microsoft/Ashton-Tate/Sybase SQL Server, which dishes out pertinent sales data into Excel spreadsheets files on request.

Time saver

The key benefit of the system is that it saves the information systems department Cobol development time while providing users with the tailored reports they want.

"I've wanted to do this ever since I used a spreadsheet program, but no one knew how," said Robert Berger, senior vice-president of administration, who implemented the system.

"Before, we would have 10 different buyers who wanted to see information at 10 different angles. To try to recode report writers in Cobol for every shade of user interest was horrendously expensive," Berger said.

With more timely and pertinent merchandise movement reports, management has been able to sharpen its advertising efforts, Berger said.

"We wanted to know whether advertised items were drawing customers to come in and purchase additional items, but there was no effective way to measure it" before the new system was installed, Berger said.

With the SQL Server/Excel setup, users can rank advertised items based on how well they sell in each store and how well they generate ancillary sales, which is the whole point of so-called loss-leader merchandise. This ranking reveals to managers and buyers which items are more effective loss leaders, and consequently, the chain can optimize its advertising.

For example, Home Express advertised a television set for a below-cost price of $57, hoping to generate ancillary sales of high-margin items. The system showed that "customers were

Continued on page 48

Home Express' *system focuses advertising efforts*

Broadcast news to see brighter day, PC style

Stock drop stresses faster information access

BY PETER BARTOLIK
CW STAFF

Another stock market plummet or two just might serve to break open the slowly evolving market for FM transmission of real-time news feeds.

"This technology really showed its value over the last four days," said Donald L. McLagan, president of Waltham, Mass.-based Desktop Data, Inc., a few days after the Oct. 13 stock drop.

Desktop Data's Newsedge product can capture up to five radio-transmitted news feeds and store them in an indexed personal computer database. It then signals the user when a story matching a user-selected profile is received.

McLagan's company is the latest to bank on the concept that business executives want more information than tomorrow's newspaper will bring them and that they want it when it happens.

In late July this year, Pilot Executive Software announced it had formed an agreement with McGraw-Hill News to integrate the McGraw-Hill, Inc. division's FM feed into its Pilot EIS executive information system. Lotus Development Corp., through an acquisition, began offering its Signal system, which provides a stock quotation news feed, in October 1985.

"More is better, particularly if you can filter it," said Jude T. Gartland, senior vice-president with the investment banking group at Shearson Lehman Hutton, Inc., who has viewed Desktop Data's Newsedge product and will be one of 24 beta testers over the next few weeks.

Without question, there are services aplenty seeking to provide all the news you can use. Desktop Data has signed up McGraw-Hill News and PR Newswire, and the company will offer to its beta testers Dow Jones & Co., Inc.'s Dow Jones News/Retrieval and Dow Jones Professional Investor Report services, in addition to Reuter PLC's Reuters Financial News.

The organization responsible for the transmissions is offering similar services for more than 20 organizations, from the Associated Press to more specific services such as Federal Filings, Inc.'s reports on Securities and Exchange Commission filings, according to John Bennion, marketing manager of Mainstream Data, Inc. in Salt Lake City.

Mainstream provides FM transmission to a 50-mile radius in 13 major metropolitan areas, which Bennion said covers 50% of the U.S. population.

Don't count on cheap

Such service is not cheap. Desktop Data will offer annual subscriptions ranging from $7,500 for a starter kit that includes McGraw-Hill and PR Newswire to $40,000 for five services.

However, said David Marshak, an analyst with Patricia Seybold's Office Computing Group, that price is "nothing for the information junkies."

And, he added, most companies have two or three librarian-type employees maintaining clipping files on business news activities, and they would find these costs to be insignificant.

But FM transmission of data has certainly not spurred any general market, although the financial industries have latched on to various real-time stock quotation services.

Lotus' Signal, for example, has not grown as rapidly as the company expected, according to Steve Sieck, vice-president of electronic services at market research firm Link Resources Corp.

He estimated that it has 12,000 to 15,000 subscribers, with most of them using the Lotus handheld Quotrack device rather than the PC-based service.

A spokeswoman for Lotus, which recently was reported to be trying to sell off Signal, said that the estimate was high but declined to provide specific figures.

McGraw-Hill News marketed its own Executive One service for a brief time, providing information from various McGraw-Hill news operations via FM transmission.

But McGraw-Hill determined that customers "were making sophisticated requests to the software that we weren't in a position to handle," said Anthony Durniak, general manager at the News division, and so has decided to work with software companies to provide the interface and manipulation capabilities needed to meet those demands.

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Market readies itself for bevy of 486-based hardware introductions

BY PATRICIA KEEFE
CW STAFF

During the next two months, power users and networks pressing against the limits of the formidable 33-MHz 386 platform will be showered with the fallout of a veritable avalanche of Intel Corp. I486-based hardware.

These products typically will ship in volume in January and will cover the gamut from add-in cards to upgrade boards, desktop computers and file servers.

Pricing varies widely for 486 desktop computers, ranging from $9,000 to $25,000.

Already, IBM, Hewlett-Packard Co., Ing C. Olivetti & Co., AST Research Corp. and ALR Corp. have either detailed plans or rolled out add-in cards and desktop computers featuring the I486 chip — some with the Micro Channel Architecture (MCA) bus and some sporting the rival Extended Industry Standard Architecture (EISA).

In two weeks, Compaq will kick off the flashiest 486 fest by far at a day-long conference in Houston featuring hordes of supporting products from network adapter cards to graphics and memory add-in boards.

Fremont, Calif.-based Copam U.S. last week introduced a 486 EISA computer said to feature 2M bytes of memory, expandable to 16M bytes, and eight slots — four IBM AT-compatible and four EISA. Pricing details were unavailable.

Europe likes it

Europe, too, is proving a hotbed of 486 announcements. Besides IBM and HP, which unveiled their new platforms both here and abroad, Olivetti, Tandon Corp., Research Machines, American Mitac Corp. and the Netherlands-based Tulip Computers have introduced 486-based machines in the last 30 days.

The most recent introductions come from Tandon and Research Machines.

Tandon unwrapped its 25-MHz 486-based EISA desktop computer in London two weeks ago, rejecting upgrade 'power' modules as too restrictive.

"We are using the Intel EISA chip set but have added custom technology to enhance the performance," founder Jugi Tandon said.

Tandon claimed it has designed the computer's bus to accommodate the 33-MHz version when it is available. To further boost the machine's performance, the company has added "posted writes," which reportedly accelerate processor-to-memory writes much as caches improve memory-to-processor-read characteristics.

The 11.7 million instructions per second (MIPS) machine's BIOS has been extended to include automatic EISA adapter card recognition and configuration, eliminating the need for reference diskettes.

There are six 32-bit EISA slots that can also take conventional IBM PC AT-type cards; the motherboard also has two 16-bit AT-compatible slots to accommodate any AT-type card that encounters problems when inserted in an EISA slot. "It's good insurance for the user," Tandon said.

Olivetti's EISA standard

Olivetti [CW, Oct. 23] has also standardized on the EISA bus, while American Mitac Corp. introduced an 80486 MCA PC and Tulip unwrapped the TR 486, its 486-based PC running on the ISA-standard bus.

Research Machines plans to take a whack at the Unix-based engineering workstation market with its RM VX486. Positioned as a "personal workstation," the RM VX486 comes with either DOS or OS/2 or can be preconfigured for Unix.

The 10.4-MIPS machine also utilizes the firm's OverDOS technology, which is said to allow DOS programs to use memory above 640K bytes.

With its 32-bit memory bus, 2M to 16M bytes of 80-nsec, close-coupled random-access memory (RAM) can be specified. Its basic offering features five ISA expansion slots.

PC Business World, *a CW affiliate in the UK, contributed to this report.*

Expert system

CONTINUED FROM PAGE 41

According to its makers, the Rex chip works with the existing software resources of a PC or a workstation. For example, a user could set up expert system rules to automatically input or process fields in a Lotus 1-2-3 spreadsheet.

Harvey P. Newquist, publisher of "AI Trends," a newsletter in Scottsdale, Ariz., said other firms have implemented aspects of AI in silicon before.

"Texas Instruments and others have LISP chips," he said, adding that LISP is a prime component of expert systems. However, he added, "It can also be used for graphics."

Some AI interest

A small segment of the marketplace might demand a chip optimized for AI applications, much as "most users don't require a math coprocessor, although there is a market for it," Newquist said. On the other hand, he observed that the trend is toward "integrating expert systems, AI and natural language products into other areas" and making them run on standardized machines with mainstream applications.

Ricoh Corp. parent Ricoh Co. Ltd, Tokyo, which is manufacturing the Rex chip and board, earlier this year took a 25% stake in 4-year-old, privately held ICC. The sample unit price for the Rex board — a beta test for the product began in early October — is $1,500. The Rule Compiler software will be similarly priced.

Along with the PC and workstation board-level products, machine-to-machine applications using Rex technology are under development, according to ICC and Ricoh.

The current Rex chip runs at 10 MHz for a maximum inference speed of 3.33 million instructions per second (MIPS). A second release of the chip will run at 20 MHz and double the MIPS rating, according to ICC.

Keefe

CONTINUED FROM PAGE 41

er see the light of day. But at least one board maker that says it's been wooed by the EISA camp claims Compaq has been a lot quieter on the EISA front lately. If MCA outbattles EISA on the desktop, you can bet you'll hear Compaq talk "MiCA."

Snubbed, but not stopped. 3Com may not be among the legions at Compaq's EISA/486 unveiling — Compaq sees 3Com as a competitor in the server hardware wars — but the following day, look for 3Com to unveil a 486/MCA-based accelerator board for its recently introduced 80386-based 3Server/500.

Excel Killer? Lotus Development's 1-2-3/G, a version of its popular spreadsheet running under OS/2 Presentation Manager, goes into beta-testing shortly. A source recently got a good look at 1-2-3/G and said it is looking a lot like Microsoft's Excel. "Visually, it is radically different from what current Lotus users are accustomed to," the source said.

Lotus has added Solver, a goal-seeking attribute that allows users to do what-if scenarios, and is utilizing cascading menus, which are typically found in Unix applications. Key strokes are generally the same, although users will have to learn a few new steps, the source said.

Only the beta users know for sure. Microsoft Chairman Bill Gates was overheard at Info demanding to know, "Is [Lotus Development President Jim Manzi] or is he not going to ship Notes with Windows support within the next 60 days?"

The answer is yes, but only because Notes is groupware, a Lotus spokeswoman said. Since Lotus owns an estimated 70% of the DOS spreadsheet market, it is unlikely to turn its nose up at Windows if sufficient demand surfaces, she added. Lotus reportedly is hard at work on a Windows version of 1-2-3.

Start a fire. Direct sales of LAN Manager to end users? Microsoft and 3Com deny it's inevitable, but some users and analysts see a need for it. "They should have a shrink-wrap version of LAN Manager on the market," said David Pero, a Dataquest analyst. "It would probably help everyone."

A user at American Airlines seconded that idea, noting there are times when he'd rather not wait for vendors to solve his problems, preferring to plow ahead himself. Such a product would not hurt 3Com, and could in fact fire up the market, admitted Alan Kessler, 3Com's marketing director for the Distributed Systems Group.

Money talks, proprietary walks. Sales are down all over, a tune that is not playing well among the boys who sing loud and long about serving all LANkind. Faced with the prospect of shipping more pink slips, Novell will make a pitch for the LANlocked's attention by preempting the upcoming LAN Manager announcement next month [CW, Oct. 23]

> SALES ARE DOWN all over, a tune that is not playing well among the boys who sing loud and long about serving all LANkind.

with two briefings in the two weeks preceeding.

In addition to laying out strategy designed to ensure that various LAN Manager offerings coexist and hosting demonstrations of the latest crop of shippable LAN manager-based products, Microsoft is also expected to detail strategic directions for Transmission Control Protocol/Internet Protocol (TCP/IP) and Open Systems Interconnect (OSI) support.

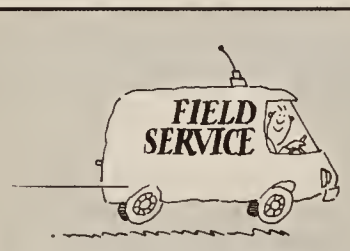
Taking a page from the same book, Novell said it will talk (again) about its OSI support plans, including X.400, X.500 and naming service plans. The underlying issue here is not really OSI support, but what some might say is Novell's acknowledgment that it must back away from rigid adherence to its proprietary IPX/SPX protocols to open up the enterprise to Netware users. Since Novell has so many undeliverables on its plate now, a shippable product seems unlikely. But former Novell VP Craig Burton, now a consultant with Clarke Burton, notes that one of the reasons Novell bought Excelan was for its (surprise!) OSI expertise.

Separately, an NCR Corp. announcement on Halloween will spotlight the first delivery of a Portable (Unix) Netware-based server. NCR will also announce two new Tower server products.

An Apple a day. Microsoft reportedly will license technology co-developed by 3Com and Pacer that provides both LAN manager support for Apple Macintoshes and compatibility with Apple's Appletalk File Protocols. 3Com will demonstrate 3+Open for Macintosh at its Network System Forum being held this week; it ships in the first quarter. Asked to confirm the deal with Microsoft, 3Com founder Bob Metcalfe hedged: "Er, ah, it's possible, but not definite."

Get those orders in. Compaq does have some inventory to support customers who have standardized on the now history 26-pound Portable II. "We'll accept orders until we use up the inventory," said a spokeswoman.

Keefe is a *Computerworld* senior editor, PCs and workstations.



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SQL

CONTINUED FROM PAGE 43

coming in for the $57 TV and then leaving the store," Berger said. "So we not only paid to advertise the item, but it didn't provide any profit."

On the other hand, the system proved that a bed sheet loss leader effectively led to increased purchases of towels and items from other houseware sections, Berger explained.

Other reports help managers determine which items are sales dogs and which are winners. Such knowledge has an impact on the bottom line, since the company purchases newspaper space for a half-dozen ads every week, Berger said.

"I can't quantify the savings," Berger said. "But if we're spending the same amount of money on advertising but have stopped advertising items that don't generate profits, the savings are obvious."

Nonmerchandise applications include reports on which stores spend the most for utilities and which are able to economize — "something that was not cost-efficient enough to justify going out and designing permanent Cobol programs," Berger noted.

Home Express was a beta-test site for the system, which was designed by Datawhiz International in Foster City, Calif. Berger opted to test it after concluding that there was nothing else quite like it being offered at the time. "We took a look around but couldn't find anyone else who was taking data from files like ours, putting it in a relational database and then allowing us to put the results into a spreadsheet," Berger said.

Following a month of debugging, the system was up and running and has been for the past seven months. User training took only a month, since Home Express employed its experience with spreadsheet applications.

Home Express' Berger *points to savings from use of the SQL Server spreadsheet system*

Home Express already had a system in place responsible for downloading sales transaction data from store POS systems into Wang Laboratories, Inc. VS 85 and VS 100 machines. The firm added an Intel Corp. 80386-based personal computer to host the SQL Server, and tied it to its 105 Wang terminals and PCs with 3Com Corp.'s 3+Open LAN Manager-based local-area network.

Next

CONTINUED FROM PAGE 41

and sophisticated audio capabilities. "With Next, you're looking at the future," declared Informix Software, Inc. Marketing Director Doug Edwards. The company's popular Wingz graphic spreadsheet will be one of the first important business applications to arrive for the Next machine when it debuts early next year.

Ashton-Tate Corp. and Lotus Development Corp. have presented high-flying but still vaporous development plans for Next. Additionally, IBM said it will license the Nextstep software development environment.

In fact, most of the lofty promises from developers remain unmet. But this should be steadily changing. A strong lure is Next's 256M-byte optical disc, which will be able to provide up to 200 times the capacity of a floppy disk and more than 10 times the total storage on most hard disks.

With such a large amount of storage, developers will be able to beef up their standard offerings with such capabilities as dictionaries, templates, sample documents and comprehensive help files.

In related news, Next said recently that it plans to offer a network-user version of its computer system with a 40M-byte accelerator drive for $7,995. In this setup, the optical drive is used as the start-up, application and data drive, while the 40M-byte Accelerator drive functions as the "swap" drive.

Micro 1 issues benchmark challenge

PHOENIX, Ariz. — Micro 1, Inc., a supplier of IBM-compatible Intel Corp. 80386-based computers, has announced the Power/386, which it claims outperforms Compaq Computer Corp.'s Deskpro 386/33 by seven to one based on Micro 1's benchmarking.

"We're inviting users to run their own [between the two machines] and compare," company President Jerry Silbert said. The $9,500 system is reportedly priced 20% to 30% below competitive offerings. Features of Power/386 include an intelligent 32-bit disk cache controller; 33-MHz operation at 7.5 million instructions per second; a 100M-byte hard disk; 2M bytes of dynamic random-access memory expandable to 32M bytes; 32-bit direct memory access; and support for DOS, OS/2, Unix Version 3.2 and Xenix.

In addition, Micro 1 unveiled the 386-16SX. Available now, it costs $1,495, "less than most [Intel Corp. 80286] systems," claimed marketing director Rick McCabe. The 386-16SX comes standard with 512K of RAM, expandable to 8M bytes; page-mode interleaved memory; zero-wait state; a 1.2M byte 5¼-inch floppy drive; a 40M-byte hard disk and a 12-in. flat screen monitor. DOS, OS/2, Xenix and Unix System V Version 3.2 are supported.

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PC Magazine, 10/31/88

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NetWare® 386 makes it easy

Netware 386 said to come close to minicomputer speed

BY PATRICIA KEEFE
CW STAFF

SAN FRANCISCO — "Netware 386" debuts at the Palace of Fine Arts here today, where sources say Novell, Inc. will paint a robust picture of the long-awaited Netware 386. The 32-bit network software will run over both Intel Corp. 80386 and 486 systems, eventually offering up to 10 times the performance of its predecessor and support for up to 1,000 users.

"It's definitely a screamer," two sources said independently. The server capability announced is expected to take local-area networks up the ladder to compete in terms of capacity with minis and superminis.

Novell will detail a two-year release strategy for Netware 386 and outline plans for various product announcements throughout 1990, said sources briefed by the firm. Licensees of Portable Netware, a Unix port that requires Netware 386, are slated to attend along with providers of various 386 servers.

A single Netware 386 server will be demonstrated supporting 250 users located on four LANs, including two DOS, an Apple Computer, Inc. Appletalk and an OS/2 LAN, according to industry sources.

Netware 386 will be released in two stages: Netware 3.0 will ship in the third quarter along with a tool kit for Netware 3.1, which will ship in early 1990.

Sources said Netware 3.0 wi include vastly improved perfo mance, security and disk capa ty; virtually "unlimited" nu bers of files and volume siz use of the 386's virtual 8(mode to eliminate the 64 byte partition for applicati reduced system overhead; more built-in services.

A modular approach wil Novell to mimic 3Com recently announced Protocol Architecture, lets users drop in and ou cific protocol stacks as n sources said. This will eliminate the need to dedicate a personal computer to each gateway.

Netware 3.1 will feature a communications server, the ability to support multiple protocol stacks and support for OS/2 LAN Manager's Named Pipes interprocess communication protocol on the server — the latter a significant reversal in strategy, said one analyst.

The long overdue and much-talked-about global naming facility, which is expected to resemble Banyan Systems, Inc.'s Streettalk, will ship as an upgrade to 3.1 at the end of 1990, a source said. Also on tap is an X.400 mail gateway that supports Novell's Message Handling System mail protocol.

Computerworld

Novell Brings 'Horsepower' To NetWare

BY TIMOTHY HAIGHT

SAN FRANCISCO — Novell Inc. last week unveiled NetWare 386—its fastest, most extensive, and ultimately, most open local area network operating system yet.

The Provo, Utah, LAN company also showed off new hardware and software developers' kits, and detailed its strategy to make NetWare an enterprise-wide network computing platform.

Users generally lauded the strategies and the new products, many of which had been expected (*CommunicationsWeek*, May 1). But several customers called for Novell to execute parts of the strategic plan more rapidly; some of the vendor's most important feature additions won't arrive until mid-1990.

"NetWare 386 is very significant, because it will allow Novell not only to add more users on a network but also to provide better management facilities and more horsepower for each job," said Bill Connett, director of computing for the University of Michi-

Communications Week

Novell wows users with NetWare 386

By Susan Breidenbach
West Coast Bureau Chief

SAN FRANCISCO — As expected, Novell, Inc. took the wraps off NetWare 386 here last week, promising 500 attendees of its 5th Annual Developers Conference that the first release will be out by early fall.

Designed for Intel Corp. 80386-based systems, the latest version of NetWare is a 32-bit network operating system that supports up to 4G bytes of addressable memory, 32 terabytes of

Network World

Netware 386 Will Triple Power of Current Version

BY RACHEL PARKER
AND MARK STEPHENS

Bringing new firepower to its network operating system war with Microsoft Corp., Novell Inc. will announce its next-generation Netware 386 product today at San Francisco's Palace of Fine Arts, according to sources briefed by the company.

Offering what Novell has said will be at least three times the performance of the company's current top-of-the-line Netware 2.15, Netware 386 is a complete rewrite of the Netware operating system and runs in protected mode on 80386-based file servers. The product is intended to blow the doors off its major competitor, Microsoft OS/2 LAN Manager, which runs in 80286 protected mode as a task under OS/2.

Novell is not expected to abandon its 286-based Netware 2.1X product line.

Novell president Ray Noorda told financial analysts and investors attending the Hambrecht & Quist conference last week in San Francisco that Netware 386 will ship within 90 days. Sources close to the company said an August or September ship date is likely.

Netware 386 is expected to be priced in the $7,000-to-$8,000 range, substantially high-

See Netware, Page 93

InfoWorld

NetWare 386 Preview: Speedy New Release Was Worth the Wait

Editor's Note: Since early July, Novell Inc.'s NetWare 386 operating system has been beta tested at several sites across the country. Presented on this page and the facing page are the opinions and experiences of two beta testers, one at Martin Marietta Data Systems and the other at the University of California at Los Angeles. NetWare began shipping last week, according to Novell officials.

By Garry Frenkel

By now most people interested in LANs have heard and read a great deal about Novell's new NetWare 386. Longtime Novell users have eagerly awaited NetWare 386, and as a beta-test user I can easily say that it was worth the wait.

From the use of 1.2M-byte floppy disks (finally), to the scaled-down but still excellent documentation, to the simple installation (yes, it really does take less than 20 minutes), to the increased functionality, to the near-blinding speed, Novell has done a splendid job.

In our lab at Martin Marietta Data Systems, we have seen applications running on a NetWare 386 server show performance improvements of greater than 40 percent over a NetWare 286 server. This is impressive. The improvements in security are also welcome. Passwords are now enerypted at the workstation before being transmitted to the server.

For users running older versions of the workstation shell, the server can be set to allow unencrypted passwords.

In the past, our monitoring equipment was easily able to read the NetWare passwords as they were transmitted to the

PCWeek

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to believe what you read.

Novell Is Shipping Netware 386 3.0 Earlier Than Expected

BY DAVID J. BUERGER

PROVO, UT — To the surprise of beta testers and industry insiders, Novell Inc. shipped last week its first copy of Netware 386, Version 3.0 earlier than expected.

Early users will be limited to file and print service, however, with server-based applications and multiple protocol support not scheduled to appear until 1990.

Netware 386, price
significant increases i
services over Netware
previous top-end pro

"We've had very few problems with server crashes," said David Hoisbe, network project director at the University of Utah. "Overall performance is impressive."

Hoisbe said ad hoc tests showed Netware 386 performing roughly 15 to 25 percent faster than the 286 version.

Beta testers liked the easier installatio
he capability for one volun
32 physical drives.
esent from this release is
Workbench, based on

Watcom 386 C compiler and required to develop Netware 386-specific applications, called Netware Loadable Modules.
[Netware 386] is ready
unity quite

Because development tools are missing, testers agree that Netware 386's primary current value is for file and print sharing.

Users will have to wait for Version 3.1 for other Netware 386 features like
multiple transport protocols
unications like
s. Version 3.0
protocol.
nterested in is
cols, especially

InfoWorld

NetWare 386 gets high praise

BY JOEL SHORE
Provo, Utah

Novell Inc., riding a wave of rave reviews from beta testers, last Tuesday began shipping NetWare 386, keeping its word that the "networking platform for the 1990s" would r
before the end of Sep

The first customer t
a production vers
NetWare 386 VINE
was Coca-Cola Foods o
ton, one of 24 sites tha
tested the product.

"Corporate America ha
growing its LANs faste
pushing them further thar
body could have imagined,
Cheryl Currid, director of
plied Information Techno
at Coca-Cola Foods.

NOVELL CHANGES RULES

"As a result, LANs were b
ing asked to do things that the
weren't designed or optimize
to do. From my perspective, t
wall was about to be hit. Now,
as a result of the efforts that
went into NetWare 386, the
rules and the limitations of the
network game have just
changed. Novell has pushed
the wall back," said Currid.

As part of its development program, the product underwent vigorous beta testing at 24 sites, including United Parcel Service, Martin Marietta Corp., Southern California Edison and Oregon State University.

"Comments from our [beta]

Computer Reseller News

NetWare 386 May Pack Punch To Knock Out the Competition

By Bob Enyart

Novell Inc.'s NetWare 386 won't give Banyan Systems Inc.'s ownership of the premier naming service—StreeTalk—a run for its money, nor will it reduce the unique appeal of Microsoft Corp.'s LAN Manager, with its OS/2 compatibility and such features as automatic disconnect/reconnect.

However, NetWare 386 will blow away the competition—including Novell's own 286-based NetWare 2.15—in performance,

functionality and flexibility, based on a beta version examined by PC Week at Novell's Pro-

For Other NetWare 386 News, Turn to Pages 8, 10 and 35.

vo, Utah, headquarters.
For those with the fin
wherewithal to spri
system—initia

PCWeek

NetWare 386: The network server platform for the '90s

BY JODI MARDESICH

SAN FRANCISCO—The waiting and speculation are over. Novell has unveiled NetWare 386 v3.0 and v3.1, the company's "server platform for the '90s."

"NetWare 386 is a major redesign of the NetWare operating system that takes advantage of 386 architecture," said Richard King, vice president of software engineering for Novell's NetWare Products Division. "It is a 32-bit operating system, so it fully exploits the capabilities of the 386 [chip] and improves performance.

"Our benchmarks show NetWare 386 is 200-300% faster than the 286-based versions of NetWare."

NetWare 386 supports up to 250 nodes per server, up to 32GB volumes, with 32 physical drives per volume for a total of 1,024 physical drives per server; 100,000 concurrent open files; more than 2 million directory entries per volume; a maximum file size of 4GB (files can span physical drives); a maximum volume size of 32 terabytes (1,000GB); and up to 4GB of memory in the server.

NetWare 386 will ship third quarter 1989.

LOADABLE MODULES

"NetWare 386 is not just another file server," King said. "It's designed as a network server operating system."

King said the operating system has been architected in a modular way, so that users can incrementally add functions to the server platform using server-based applications called NetWare Loadable Modules (NLMs).

NetWare printing services, the LAN drivers, disk drivers, Btrieve, and some NetWare utilities, including installation, are being implemented as NLMs.

"By loading an NLM, you actually extend the operating system," King said.

"The key to NetWare 386 is its

continued on page 9

LAN TIMES

NOVELL

For network solutions, you should be seeing red.

For more information, call 1-800-LANKIND.

NEW PRODUCTS

Systems

Sun Moon Star has introduced an Intel Corp. 80386SX-based machine targeted specifically at small businesses.

A basic configuration of the Sun Moon Star 386SX includes a 16-MHz 80386SX mainboard, 1M byte of random-access memory, a 40M-byte hard disk drive, a 1.2M-byte 5¼-in. floppy drive and a 14-in. screen monitor. The system will be priced from $2,995, and a three-year warranty is included.

Sun Moon Star
1941 Ringwood Ave.
San Jose, Calif. 95131
408-452-7811

Amdek Corp. has announced price reductions for several of the company's Intel Corp. 80286- and 8088-based personal computer models.

The suggested list price of the 16-MHz 80286-based IBM-compatible Amdek System/286A:16 was reduced from $2,899 to $2,399; the price of the 12-MHz System/286A with a single diskette has been dropped from $2,399 to $2,199; the 10-MHz 8088-based System/88 dropped from $1,075 to $949; and the System/286N 80286-based diskless workstation, formerly priced at $1,999, is now offered at $1,799.

The company has also lowered the price of its AM/132 adapter by $100; the product now carries a suggested list price of $345.

Amdek
1901 Zanker Road
San Jose, Calif. 95112
408-436-8570

Toshiba America Information Systems, Inc. has announced the T3100E/40, a higher storage capacity version of the Intel Corp. 80286-based T3100E 20M-byte portable personal computer.

The T3100E/40 has a reported access time of 24.4 msec. and includes a standard 1M byte of random-access memory. Other standard features include an internal IBM-compatible half-length expansion slot and a 1.44M-byte, 3½-in. floppy disk drive. A 40M-byte upgrade kit is available for users of the 20M-byte T3100E.

The T3100E/40 carries a suggested retail price of $4,699.

Toshiba America
9740 Irvine Blvd.
Irvine, Calif. 92718
714-583-3000

Macintosh products

Forte Communications, Inc. has announced a battery-operated remote keyboard for Apple Computer, Inc. Macintosh computers.

Remote Mouse is reported to allow full control of a Macintosh from distances of up to 50 feet. This includes pointing, clicking, dragging and menu selection.

The Remote Mouse costs $395.

Forte
1050 E. Duane Avenue
Sunnyvale, Calif. 94086
408-733-5100

SAS Institute, Inc. has announced a statistical visualization tool for the Apple Computer, Inc. Macintosh marketplace.

JMP is interactive spreadsheet software that reportedly gives users standard statistical functions in an instant push-button environment for graphical data analysis.

The system fully supports all three measurement levels (interval, ordinal and nominal) both as responses and factors. It is priced at $695, with volume discounting available.

A 2M-byte memory level is recommended for operation.

SAS Institute
SAS Circle
Box 8000
Cary, N.C. 27512
919-467-8000

Innovative Systems, Inc. has introduced computer-aided design software specifically developed for the Apple Computer, Inc. Macintosh machine.

Called Precision, the package reportedly offers 2½-dimensional drawing capabilities combined with editable macro files and analysis functions. Geometry tools and global replace symbols are also included. The suggested list price of $295.

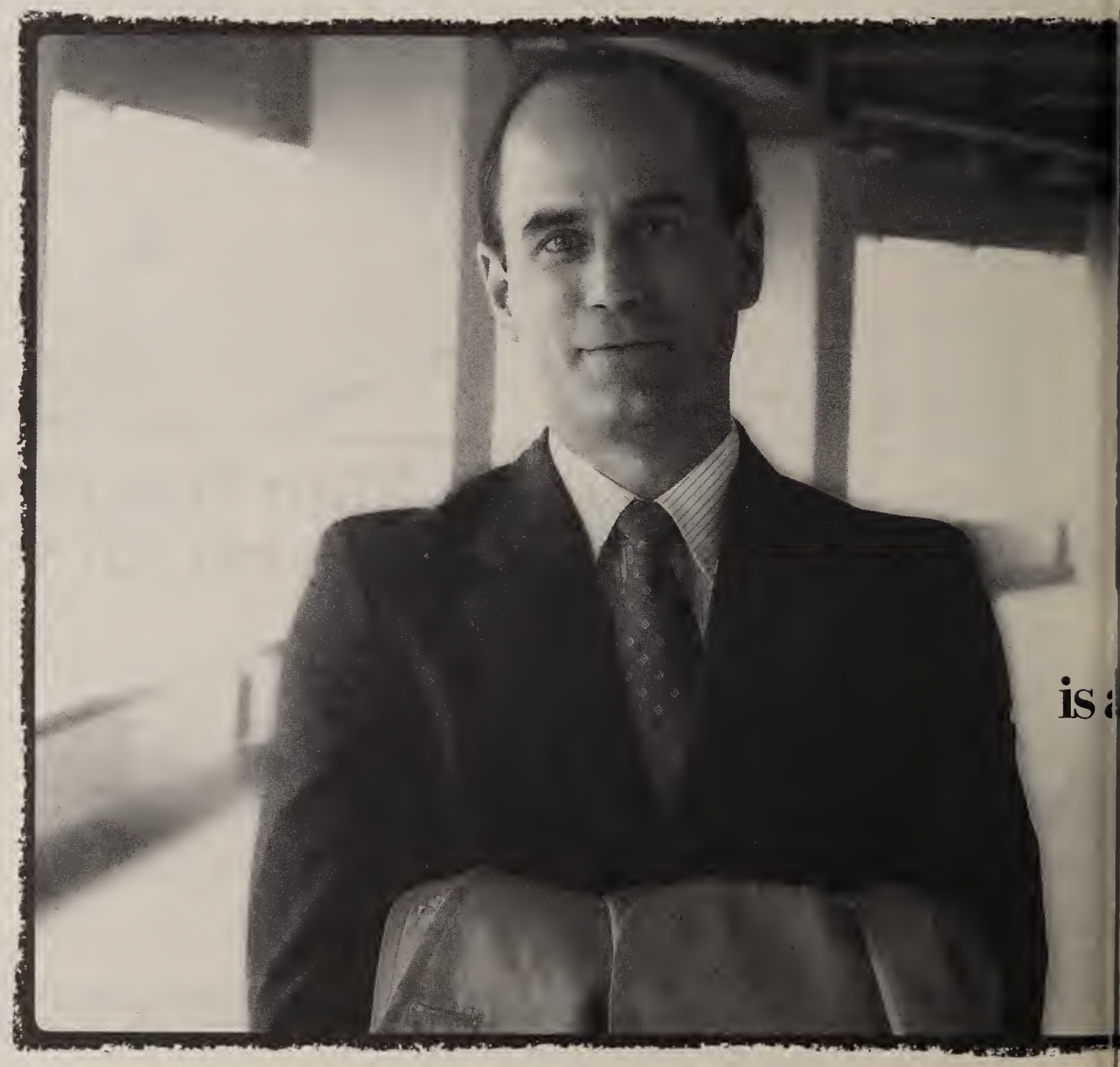
Innovative Systems
171 Interstate Drive
W. Springfield, Mass. 01089
413-737-3993

Data storage

Alphatronix, Inc. has introduced a 16.2G-byte jukebox configuration for its Inspire erasable optical storage system for Digital Equipment Corp. and Sun Microsystems, Inc. workstations and IBM Personal Computer AT-based machines.

Jukebox + Inspire reportedly includes space for 25 5¼-in. International Standards Organization cartridges, each holding up to 650M bytes of data. Cartridges recorded in a single- or dual-drive Inspire system can be added to the jukebox without modification, Alphatronix said. The 19- by 30- by 21-in. unit fits into standard 19-in. racks or can be enclosed in a stand-alone unit. Pricing starts at $49,900.

Alphatronix
4900 Prospectus Drive
Research Triangle Park,
N. C.27709-3687
919-544-0001



The IBM AS/400 Midrange Solution.

Ever hear someone ask to have their computer system made smaller? We haven't lately.

Growth is the name of the game, and it's one of the first realities that the IBM Application System/400™ was designed for.

From smallest to largest (from a few users to hundreds), all models of the AS/400 share the same architecture and operating system. So even if you can't predict how big your system will ultimately need to be, you can count on your applications to always work, and your investment in software and training will be secure.

Hardware growth isn't so hard either.

Most models of the AS/400 come rack-mounted like a stereo system to give you latitude right from the start.

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Dickens Data Systems, Inc. has announced an 8mm cartridge tape subsystem designed for unattended backup of IBM RT disks.

The Dickens Model 8200 helical-scan tape subsystem is capable of storing up to 2.2G bytes of formatted data, the vendor said, and provides backup for 300M-byte and larger RT disks. Peak transfer rates are reported to be 1.5M byte/sec. with sustained transfers of 256K byte/sec. The Model 8200 comes with IBM's AIX software drivers to support a variety of formats and is priced at $6,200.

Dickens Data Systems
Suite 230
3850 Holcomb Bridge Road
Norcross, Ga. 30092
404-448-6177

Development tools

Easyspec, Inc. has released a computer-aided software engineering tool for IBM Personal Computer AT-class machines running Microsoft Corp.'s Windows software.

Object Plus is said to generate source code in object format for Ada and C and supports the full software development life cycle. The product includes an element dictionary, an object repository, data modeling and import and export facilities. The package costs $6,700.

Easyspec
17629 El Camino Real
Houston, Texas 77058
713-480-3233

Graphic Software Systems, Inc. has announced character-based versions of the GSS XVT Extensible Virtual Toolkit.

Designed for DOS, OS/2 and AT&T Unix System V programmers, the software reportedly allows character-based applications to provide ease-of-use functions similar to those found in the Microsoft Corp. Windows environment. The XVT platform is a programming tool for developing C applications that support multiple graphical user interfaces. The character-based versions are priced from $395 to $595, depending on operating environment.

Graphic Software Systems
9590 S.W. Gemini Drive
Beaverton, Ore. 97005
503-641-2200

The IBM AS/400 Model B35.

Software applications packages

Wordperfect Corp. has released Wordperfect 5.0 for the Digital Equipment Corp. VAX/VMS platform.

According to the vendor, the latest version offers more than 45 new features and 75 enhancements to its predecessor, Wordperfect 4.2. The new software contains multiple fonts, leading, kerning, styles and enhanced laser printing capabilities, and text and graphics may be displayed on nongraphics terminals.

Customers with a current software subscription contract can receive the Wordperfect 5.0 upgrade at no cost.

Wordperfect
1555 N. Technology Way
Orem, Utah 84057
801-222-4435

Astral Development Corp. has released Version 2.0 of Picture Publisher, a gray-scale image editor that runs under a Microsoft Corp. Windows environment.

Designed for IBM Personal Computers, Personal System/2s and compatibles, the software now reportedly includes support for most popular scanners and frame grabbers, as well as the ability to import bitmaps from the Windows clipboard. The program is priced at $595 and will be available free to registered users who have purchased a previous version on or before Aug. 1.

Astral Development
Londonderry Square
Londonderry, N.H. 03053
603-432-6800

Xyquest, Inc. has announced its most recent version of the Xywrite word processing package.

According to the company, Xywrite IV incorporates what-you-see-is-what-you-get text, imported graphics and a menu interface. Users will reportedly be able to import scanned images into a document and see the results on-screen.

The package will reportedly be released in the first quarter of 1990 with a list price of $495.

Xyquest
44 Manning Road
Billerica, Mass. 01821
508-671-0888

Du Pont Information Engineering Associates has announced the release of the first two modules of its Treasury Information Management System (TIMS).

According to the company, the first TIMS module, Bank Relationships and Exposure Management, is designed to monitor a company's overall activities with commercial banks by tracking pre-approved exposure limits with each institution. The second module, Bank Account Administration, manages administrative details of each account with an institution. This includes opening an closing of accounts, changing signatories and authorities, as well as an account directory.

Module three, Bank Compensation Management, is slated to be released in December.

IEA has stated that the price for all three TIMS modules will be approximately $25,000.

Information Engineering Associates
Nemours Suite 9432
Wilmington, Del. 19898
800-638-4637

As Global Competition Intensifies, Information Systems Must Change From A Service Function To A Competitive Weapon.

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DATA STREAM

Jeffrey N. Fritz

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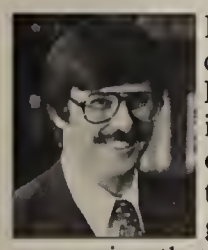


Recently, I received a call from Bellcore, which is a research facility, funded by the seven regional holding companies, that plays a key role in telecommunications development. I was extremely pleased to receive the call because it is healthy for the future of Integrated Services Digital Network when pacesetting agencies such as Bellcore request direct input from users.

Acknowledging the myriad differences among various customer-premises equipment vendors' implementations of ISDN, Bellcore wanted to know if users would benefit from a coding system built into an ISDN desk set or terminal adapter. This would allow a user, before setting up ISDN communications with another device, to

Continued on page 63

Inside

- Ungermann-Bass links up with Mac LANS. Page 58.
- Compuserve, Prodigy offer 'earthquake forum' bulletin board service. Page 62.
- IBM, DEC join OSI. Page 62.

Sky is limit for Nissan's Infiniti

ON SITE

BY ELLIS BOOKER
CW STAFF

CARSON, Calif. — There's no car in Nissan Motor Corp.'s television commercials for Infiniti, its new luxury sedan. Instead, you watch serene pictures of the tide lapping against an empty beach or a flock of distant birds in flight.

While its ad campaign may be unconventional, Nissan's choice of a satellite-based network for its Infiniti Division dealerships — some 40 to 50 of which will go on-line when the Infiniti debuts Nov. 8 — is in step with the rest of the automotive industry. According to analysts, car makers account for 29% of the very small-aperture terminal (VSAT) market today.

The VSAT network, which will connect the Infiniti dealers with Nissan's corporate headquarters, will be cheaper than services offered by conventional long-distance companies' value-added networks. But the real attraction of VSATs is their flexibility, according to Mike Hadfield, Nissan's network data processing specialist.

"The Infiniti Division literally doesn't know where the 200 dealerships we hope to have within the next two or three years will be located," Hadfield said. Because of this, a terrestrial network may have to be totally reengineered after two years. "But with a VSAT, you just put the dish in and then buy more pie in the sky," he said.

To start, Nissan will spend around $2 million on the network, which is being deployed by Scientific-Atlanta, Inc., which won the contract in May. The car maker has purchased one 56K bit/sec. inbound and one 56K bit/sec. outbound circuit through the Ku-band geosynchronous SBS 4 satellite operated by Hughes Network Systems, Inc. in Germantown, Md.

Each dealership will have a 1.8-meter satellite dish connected to an on-site IBM Application System/400 computer. A data processing unit (DPU) between the satellite dish and the processor will act as the X.25 packet assembler/disassembler, as well as handle protocol conversion. Using Synchronous Data Link Control over the satellite-based X.25 packet network, the AS/400s will link to an IBM 3090 Model 500 mainframe running MVS/XA in Nissan's Culver City, Calif., headquarters.

Applications available to Infiniti dealers will include:

- Sales prospect processing.
- On-line warranty processing.
- A vehicle locator to speed ordering of cars.
- On-line vehicle service histories.
- Electronic mail services.

Each site will have 15 to 20 personal computer users connected to the AS/400. However, mechanics working on cars in the service bays will use more rugged terminals to connect to the on-site processor.

The 3090 was upgraded from a three-processor Model 300 to handle the VSAT network, as were the front-end processors on this host. Nissan exchanged the IBM 3725 communications controller for a 3745 to accommodate a "doubling of the Nissan network" over the next couple of years, according to Hadfield.

The VSAT network will be interfaced with Nissan's existing communications software, including IBM's VTAM, Network Control Program and Network Performance Monitor.

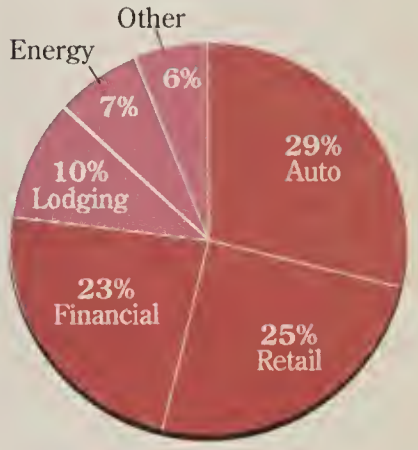
That existing network already supports 1,100 Nissan dealers linked using McDonnell Douglas Network Systems Co.'s Tymnet packet network or 800 dial-in lines. There has been no decision about using VSATs for these dealerships, Hadfield said.

Continued on page 59

The big three

The VSAT market holds a heavy vertical focus. Seventy-seven percent of the VSATs purchased have been from the auto, retail and financial industries

DISTRIBUTION OF VSATS PURCHASED BY INDUSTRY



SOURCE: GARTNER GROUP, INC.
CW CHART: FRANK C. O'CONNELL

3Com sees the light, adds SNMP support

BY PATRICIA KEEFE
CW STAFF

SANTA CLARA, Calif. — Plans to enhance 3Com Corp.'s Internetwork Bridge (IB) family catch the vendor doing an abrupt about-face as it caves in to mounting support for the network management protocol Simple Network Management Protocol (SNMP).

3Com said it will make support available for two network management protocols under its IB line next spring: SNMP and the Common Management Information Protocols (CMOT), which it has championed. In addition, the routing bridges will also be network-bootable to enable a network administrator to easily upgrade and maintain network software.

The enhanced bridges will be demonstrated this week at the vendor's second annual Network Systems Forum in San Jose, Calif., where 3Com will outline its network management architecture and strategy.

Chalk up the decision to support both protocols to being realistic about where the market is right now, said George Marshall,

Continued on page 59

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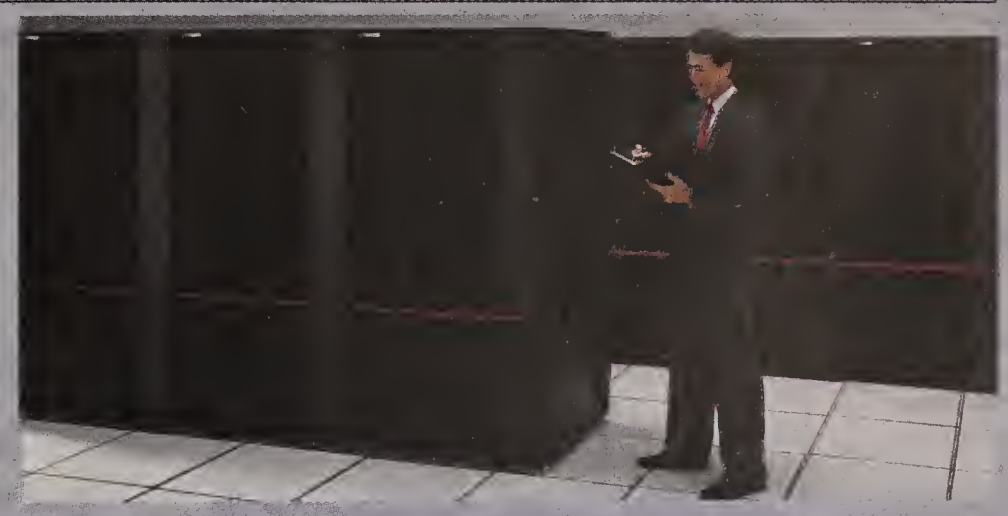
Based on an audited benchmark comparison, a single-system Cyclone with NonStop SQL delivers more than twice the power, at less cost, than a 3090/600S with DB2.



For instance, continuous availability – a result of multiple processors and components sharing the workload.

And linear expandability. Which means getting the full amount of added performance from each added processor.

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Ungermann-Bass targets Apple, FDDI with networking capabilities

BY ELISABETH HORWITT
CW STAFF

SANTA CLARA, Calif. — Ungermann-Bass, Inc. has expanded the networking versatility of its Access/One networking platform with links to Apple Computer, Inc. Macintoshes and Appletalk local-area networks, as well as to Fiber Distributed Data Interface backbones.

However, the company would give no definite time frame for when it plans to support several other strategic networking environments that rival firms have already begun incorporating into their systems. Ungermann-Bass has backed off from two environments for which it had announced support in the past — Open Systems Interconnect (OSI) and IBM's Netview.

The vendor was in fact in the vanguard of companies that announced an intention to support IBM's Netview through the Netview/PC interface. However, Ungermann-Bass quietly discontinued its efforts to develop an interface between its Access/ One Manager and the IBM Personal Computer-based system. Instead, it became one of seven vendors to announce support for the OS/2 Extended Edition version of Netview/PC, when IBM announced the interface more than a year ago.

Waning demand

However, an actual product may take some time to arrive. Ungermann-Bass Vice-President of Marketing and Sales Michael Gardiner stated that user demand for Netview/PC support, initially strong, has dropped off of late.

In contrast, Gardiner admitted that user demand exists for the Simple Network Management Protocol (SNMP) for managing Transmission Control Protocol/ Internet Protocol (TCP/IP) networks but still would give no time frame for when Access/One Manager will support the de facto standard. This puts Ungermann-Bass behind many of its rivals, which have jumped on the SNMP bandwagon in the last few months (see story page 55).

Lack of demand was the reason Gardiner gave for Ungermann-Bass' decision not to announce any more OSI-based products, at least for the short term. The vendor made an early — reportedly too early — foray into the OSI-Manufacturing Automation Protocol market, through its former subsidiary, Industrial Networking, Inc. (INI).

Ungermann-Bass retains INI's "core OSI technology" and is participating in the OSI arena by sitting on standards bodies and taking part in demonstrations, such as the recent OSI-Netbios demonstration at the Interop '89 show, Gardiner said.

However, the vendor is "waiting for OSI to mature" before it reenters the market, he added.

Key among Ungermann-Bass' recent product announcements was Maxtalk, a hardware and software module that is said to connect up to 16 Apple Localtalk devices, or 16 daisy-chained Localtalk networks, over an Ethernet or Token-Ring backbone. The product is said to use filtering and routing techniques to decrease overall network traffic, and therefore significantly increase bandwidth available to individual devices.

> THUS, WHILE conventional Localtalk networks divide up a single 230.4K bit/sec. channel among multiple users, Maxtalk is said to provide as much as 230.4K bit/sec. per user, depending on traffic configurations.

Thus, while conventional Localtalk networks divide up a single 230.4K bit/sec. channel among multiple users, Maxtalk is said to provide as much as 230.4K bit/sec. per user, depending on traffic configurations.

Maxtalk is said to support Apple's Appletalk networking protocols. Optional MacUWS software is said to enable Macintosh users to communicate via TCP/IP protocols. It is said to allow Macintoshes to access a high-speed backbone supporting up to 10M bit/sec. without the need to equip each device with a Token-Ring or Ethernet board.

Maxtalk is priced at $4,695; MacUWS software at $350 per licensee. Initial shipments are scheduled to start within 90 days.

Ungermann-Bass also announced FDDI Superlan bridges, which are said to interconnect IEEE 802.3 Ethernet and IBM Token-Ring LANs across an FDDI-compatible fiber-optic backbone that supports speeds of up to 100M bit/sec. The Token-Ring FDDI bridge is said to support IBM-compatible source-routing functions. Bridge pricing is said to start at $3,950.

All of the above products can be managed by Ungermann-Bass's Access/One Manager, the vendor said.

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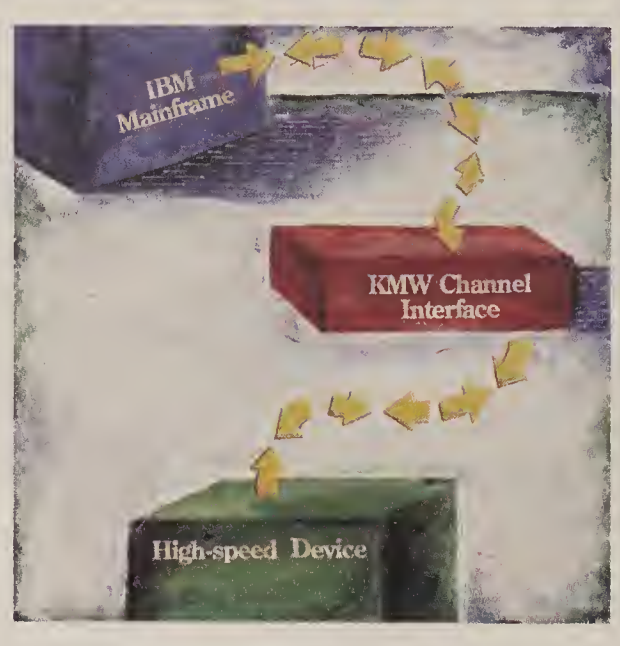

With a KMW Systems channel interface, IBM mainframe users gain a whole new world of flexibility – the ability to choose the best high-speed peripheral for their money, regardless of brand name.

KMW Systems provides IBM emulations so thorough your mainframe will think it's talking to all-IBM equipment, even though you're using non-IBM printers, disk drives, tape drives, optical disks, raster plotters or other devices.

Across the country, thousands of units are being used in applications linking IBM mainframes to high-speed printers from manufacturers such as Xerox, Dataproducts and Printronix.

KMW Systems meets demanding standards without demanding a lot from you. A KMW interface appears to the mainframe as a standard control unit, so you can attach the unit without making modifications to the host operating software. The mainframe never knows it isn't talking to IBM equipment.

And you'll never have to worry about finding an interface to fit your configuration needs.

KMW interfaces feature all popular, industry-standard bus structures – VME, Multibus, and Q-bus. In addition, KMW Systems offers a channel interface that uses a programmable parallel interface rather than a bus connection.

Depending on your price and performance needs, KMW provides both board level and system level interface solutions.

Reliable data transfer of up to 4.5 megabytes/second on a data streaming channel. A KMW channel interface is *the* technology for accessing the high-speed potential of the IBM channel with non-IBM devices.

To discover the possibilities that high-speed channel interfaces offer in your operation, call us at **(800) 531-5167.** In Europe, 44 1 844 1525.

KMW SYSTEMS CORPORATION

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Infiniti

CONTINUED FROM PAGE 55

Although data applications will be the primary job of the VSATs and voice traffic will be handled by terrestrial facilities, Nissan has considered using the satellite dishes to pull down broadcast video signals. For example, Nissan's dealers could use their VSATs to view shows on the Automated Satellite Television Network (ASTN), an independent supplier of video programming for car dealers.

The network will support batch and interactive computer communications.

"We liked that we could buy 56K bit/sec. circuits," said Hadfield, who said other vendors offered inbound circuits at 128K bit/sec. increments and outbound circuits of 512K bit/sec.

In addition, Hadfield said Scientific-Atlanta's network management system was attractive because it allows him to monitor and control resources on his own "virtual network," without having to deal with other Skylinx.25 users who may share the same earth station hub.

Howard Hecht, a senior research analyst, enterprise network strategies at Gartner Group, Inc. in Stamford, Conn., believes VSAT technology is moving fast.

"You can't assume VSATs will be the same five years from now," he said. Terminals will evolve, becoming "smaller and easier to use," while the bandwidth will increase. Gartner Group believes the next step will be T1 services.

3Com

CONTINUED FROM PAGE 55

3Com's marketing manager of network management. "We took our best shot last year at trying to convince the industry to use [only] one protocol. But it didn't work out that way."

3Com views SNMP as a very streamlined, simple protocol with a strong Transmission Control Protocol/Internet Protocol focus. It uses some of the same encoding technology found under Open Systems Interconnect. "It has a place," Marshall said.

This is not to say that 3Com is turning its back on the SNMP's rival — CMIP. That is not the case at all.

Users of 3Com's IB family can have their cake and eat it too. Not only will the enhanced IB line support whichever network management protocol gets the nod, but it will also link 3Com networks running both protocols, Marshall said.

Users on 3+Open will be better able to employ a wide variety of management tools to integrate and manage mixed vendor networks, Marshall said.

"A serious network management system today has to support several network protocols, so we're saying, 'Let's quit fighting.' "

The network boot capability maintains all IB software configuration data on a 3Com Network Control Server, allowing managers to troubleshoot nets and devices from a single point on the LAN.

VSAT mini

Analysts say to watch for a diminutive cousin of very small-aperture terminal (VSAT) technology called mobile satellite terminal.

Not only are these mobile dishes smaller — 6 to 8 inches compared with a VSAT's usual 1.8-meter dish — they're cheaper, too.

According to John Pemberton, program director of strategies and telecommunications services at Gartner Group, Inc. in Stamford, Conn., mobile terminals will cost $4,000, compared with a VSAT's $50,000 price tag.

"They're for message traffic, not for video or bulk data," said Pemberton, adding that the technology, which uses the 1- to 2-GHz frequency range, is much less susceptible to weather interference. Besides, he notes, mobile dishes let users go *mobile* and open the possibility of expanding electronic data exchange (EDI) to peripatetic field managers in cars and trucks.

Pemberton predicts the market for mobile statellites hardware and services will exceed $5 billion by 1993. However, a good deal of that cost will be building and then launching the L-band geosynchronous satellites that the mobile terminals use.

One mobile satellite vendor, Geostar Corp. in Washington, D.C., said that it will shortly announce a joint marketing agreement with IBM to use IBM's Information Network as a value-added component of its satellite radio-determination service.

Geostar customers, who affix the miniature satellite terminals to trucks, trains and planes, use the service to locate and send messages to their mobile units. Under the IBM accord, this message and telemetry data will be passed from Geostar's main earth station hub into the IBM information network. Value-added services, such as electronic mailboxes and EDI formats, are planned, according to a Geostar spokesman.

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On-line information services become lifelines after quake

BY JOANIE M. WEXLER
CW STAFF

Times of crisis have a way of igniting a spirit of harmony among people. In the aftermath of this month's devastating earthquake, that feeling transcended the debris-littered San Francisco Bay Area and spilled over to the rest of the nation, where many subscribers to on-line information services turned to their computers to help the less fortunate.

Subscribers to bulletin board services provided by Compuserve, Inc. and Prodigy Services Co. volunteered their services when they learned that many Bay Area residents could not access long-distance lines to get in touch with relatives and friends in other parts of the country.

Those in the disaster-affected area were directed to message the bulletin boards with the names and phone numbers of the individuals they needed to contact. Subscribers in the appropriate cities then telephoned to relay "I'm OK" messages from the San Francisco area.

Compuserve, a 545,000-member service, set up a special "earthquake forum" bulletin board to provide information on where to receive or donate relief supplies, help people locate one another and update the status of communications and transportation systems in the area. That forum handled 500 messages within a 24-hour period.

Some Compuserve nodes were damaged, but the company made a special WATS number available so that subscribers could still use the service, according to spokeswoman Jan Bowers.

Bowers said that most of the problems users experienced with the service were because of electricity outages.

Prodigy, a 100,000-member service, also experienced some temporary outages, according to communications manager Brian Ek, who said that the damaged nodes were restored by Wednesday morning. Ek added that Prodigy set up special earthquake bulletin boards two hours after the disaster and reported 500 postings in the first five hours, which he said was "a phenomenal geometric jump in usage."

Both Bowers and Ek commented that computers are starting to assume a similar role to the one ham radio operators play in times of natural disasters. "Now," Ek said, "anyone with a computer who is hooked up to an on-line service can go in and actually interact with people in the hit areas."

IBM, DEC throw weight behind network forum

BY ELISABETH HORWITT
CW STAFF

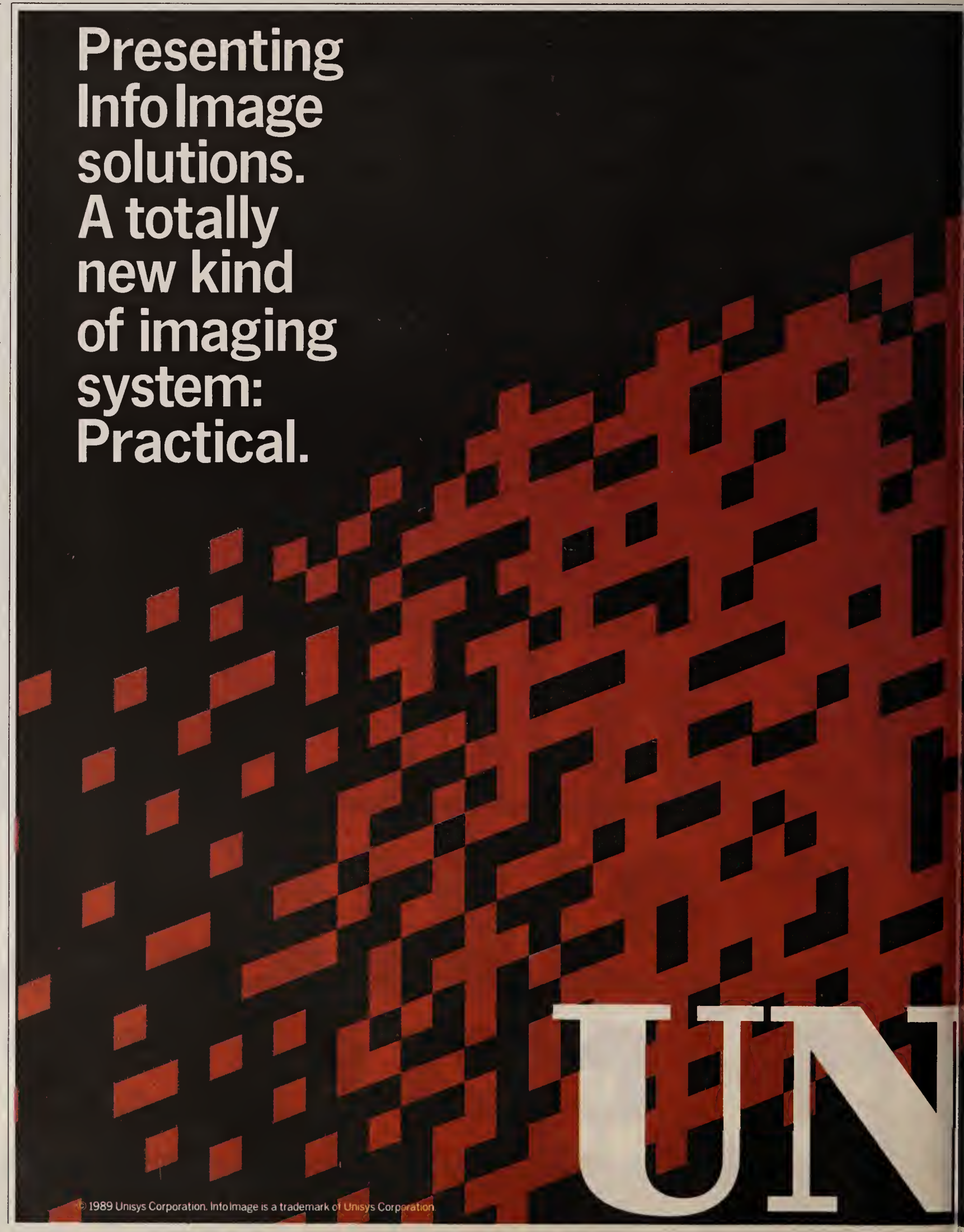
TORONTO — IBM and Digital Equipment Corp. finally joined the Open Systems Interconnect/Network Management Forum as voting members earlier this month, officially blessing the body's efforts to accelerate the development of an implementable network management standard.

For several months, both vendors had demanded that the forum perform two tasks before they would consider becoming members: change bylaws that awarded the standards body the intellectual property rights to whatever specifications are proposed by its members, and coordinate the forum's work with that of other standards bodies, such as the Corporation for Open Systems and the European organization SPAG.

DEC was primarily concerned with potential technical and legal obstacles to relicensing its own technology for use in other product areas, according to David Korf, DEC's multivendor interconnect marketing manager. By joining the Forum, DEC has committed to implementing the specifications the organization developed for ensuring interoperability among different vendors' network management systems, Korf said. However, the forum's OSI specifications will constitute one of many access modules that will provide DEC's Enterprise Management Architecture with connections to a variety of standards-based and proprietary networking systems, he added. On the second issue, Korf said, "We don't want to duplicate efforts, since we only have a certain amount of resources."

IBM is likely to incorporate the forum's version of OSI Common Management Information Protocol and Common Management Information Services into the IBM OSI/Communications Subsystem. Announced last January, the product is said to enable non-IBM, OSI-compliant networking systems to communicate with IBM's Netview.

Also last week, the Forum announced that nine companies had joined as associate members since last June, bringing membership to 15 voting members and 60 associate members.



Fritz

CONTINUED FROM PAGE 55

query that device on exactly how it communicates over a network, obtaining information such as B channel rate adaption, the type of switch generic supported, channel configurations and so on. The idea is that, in lieu of complete standards that would ensure interoperability, the user would at least have some idea of how to set up communications with another ISDN device.

Bellcore's effort, while laudable, is addressing the symptom and ignoring the disease. The disease, of course, is the lack of standards among different ISDN vendors' equipment. Cross-vendor compatibility is critical to ISDN's success in today's "show me" marketplace.

ISDN, most accurately defined as a set of standards for telecommunications, has been hampered by some major unstandardized technologies. Ironically, standardization, at least on a national level, has been a hallmark of telephone communications for years. Consistent standards would make much of Bellcore's proposed querying system unnecessary in the first place.

While several areas of ISDN technology need standardization, nowhere is the need for standards more critical than B channel rate adaption. ISDN B channels run at 64K bit/sec. However, some devices may require lower rates, such as 19.2K bit/sec. Rate adaption techniques, which provide the means of adapting the B channel to the slower rates, are frequently vendor-proprietary. Thus both sides of the B channel link must use equipment with the exact same rate adaption scheme.

That is fine in some environments. However, B channel applications tend to operate in a circuit-switched mode, where data calls can be made to a variety of destinations. Offering wide connectivity and then limiting access to restricted equipment is ludicrous. It nearly invalidates the advantages of circuit-switched data. Yet neither the Consultative Committee for International Telephony and Telegraphy (CCITT) nor Bellcore has taken a strong stand for adopting B channel rate adaption standards.

Clearly, there is a need for a pacesetting organization to lead the way in intervendor standards. As a user, I should be relieved of any concern about which rate adaption scheme my equipment uses. Until standards are universally adopted, however, I need to know in order to communicate with other users.

Consider the case of West Virginia University's ISDN implementation. The telecommunications department employs Telrad desk sets because they uniquely provide 64K bit/sec. connectivity and two data ports. Recently, the vice-president of academic affairs purchased a Fujitsu desk set because it supports the 19.2K bit/sec. synchronous access that his office needs for a LAN link.

How am I going to answer the inevitable question from the vice-president as to why he can't use his B channel for asynchronous communications to telecommunications?

If I say that he can't communicate because the ISDN devices are from different vendors, he will respond, "But I thought ISDN provided an integrated network on campus."

"It does," I'll reply. "But lack of standards cuts off the network integration at your desk set." He won't be pleased.

It's not that it's wrong for different vendors' equipment to provide different features — features that may make or break a sale. Yet we need a common denominator for ISDN data communications, and vendor partiality must not stand in the way. Bellcore acknowledges that the lack of standards is limiting the growth of ISDN. Therefore, why doesn't it use its considerable influence to pressure vendors toward those standards, rather than sitting on the sidelines and waiting? After all, nobody stands to gain more from the widespread acceptance of ISDN than do the BOCs who will be selling the lion's share of the ISDN services.

BELLCORE'S effort, while laudable, is addressing the symptom and ignoring the disease. The disease, of course, is the lack of standards among different ISDN vendors' equipment.

My kids have a favorite rhyme. It goes something like this:

"You stole the cookies from the cookie jar."

"Who me?"

"Yes you!"

"Couldn't be!"

"Then who?"

It's corny, but it does apply to the ISDN standards issue. Who will provide guidance for the ISDN standards? If not Bellcore than who? Certainly not the FCC. The CCITT? Could be — but will it be in our lifetime?

I am told, "Don't be an alarmist. Given time things will settle out."

Maybe so, but don't tell that to the proponents of quad stereo, which suffered a premature death because of lack of standards.

Fritz is a data communications analyst at West Virginia University in Morgantown.

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NEW PRODUCTS

Local-area networking hardware

Belkin Components, Inc. has extended its line of IBM Token-Ring products with a multistation access unit that reportedly complies with IBM Token-Ring and IEEE 802.5 standards and requires no external power supply.

Each Multistation Access Unit (MAU) allows up to eight workstations to operate on the network and can also be interconnected with other MAUs to form larger networks that will support up to 260 workstations, the company said.

The unit reportedly functions at both 16M bit/sec. and 4M bit/sec. rates. The price is listed at $695.

Belkin Components
14550 S. Main St.
Gardena, Calif. 90248
213-515-7585

Users of Siecor Corp.'s LAN One line of local-area network equipment can now connect to Apple Computer, Inc.'s Appletalk network environment.

According to the vendor, the fiber-optic Appletalk module, converter and extender package will enable users to connect departmentalized Appletalk networks to either a fiber-optic Appletalk backbone or a higher speed Ethernet or Token-Ring backbone.

The module costs $389, and the converter and extender are priced at $285 each.

Siecor
P.O. Box 13625
Research Triangle Park, N.C. 27709
800-888-5261

Network management

Hughes Lan Systems, a subsidiary of Hughes Aircraft Co., has announced a network management center with Simple Network Management Protocol implementation.

The 9100 Network Management Center reportedly provides comprehensive alarm reporting and handling functions, including alarm logging, audio and visual alerts and solution recommendation capabilities. It also reports on network device performance and logs key statistics, the company said. Software pricing is set at $14,000 per unit.

Hughes Lan Systems
1225 Charleston Road
Mountain View, Calif. 94043
415-966-7300

Fujitsu America, Inc. has enhanced its FMS 1000 network management system, which was originally designed for use in small modem networks.

Remview, a combination software and hardware function, reportedly enables the network operator to remotely monitor the FMS 1000 in real time.

The remote operator can also send and receive messages to the local operator via the network management system, the company said. Remview costs $1,295.

Fujitsu
3055 Orchid Drive
San Jose, Calif. 95134
408-432-1300

Links

Interactive System Corp. has announced its OSI/TCP Application Facility.

According to the company, the device permits Open Systems Interconnect upper-level protocol applications, such as file access transfer management and X.400, to operate without modification over AT&T Unix System V Release 3 STREAMS-based Transmission Control Protocol/Internet Protocol networks.

The product will be available for licensing in portable source-code form, as well as binary for Intel Corp. 80386-based systems. Shipments are scheduled for first-quarter 1990.

Interactive Systems
2410 Colorado Ave.
Santa Monica, Calif. 90404
800-346-7111

Suncoast Systems, Inc. has announced a two-way telephone-to-computer voice digitizer and phone control product.

Called Computerfone, the peripheral is able to accept, digitize, store and transfer incoming speech, the vendor said. The product also can reportedly answer incoming phone calls and convert incoming tones to standard ASCII characters for processing. The unit is priced at $695.

Suncoast Systems
P.O. Box 7105
Pensacola, Fla. 32514
904-478-6477

Diagnostic equipment

International Data Sciences, Inc. has announced an intelligent Token-Ring Medium-Access Unit (MAU) which allows a local-area network manager to isolate and repair most Token-Ring faults by using any remotely located personal computer.

The product comprises three modules, and each MAU is contained in a 7- by 9-in. rack, the company said.

Each proprietary MAU can reportedly be implemented for less than $500 per node.

International Data Sciences
7 Wellington Road
Lincoln, R.I. 02865
800-437-3282

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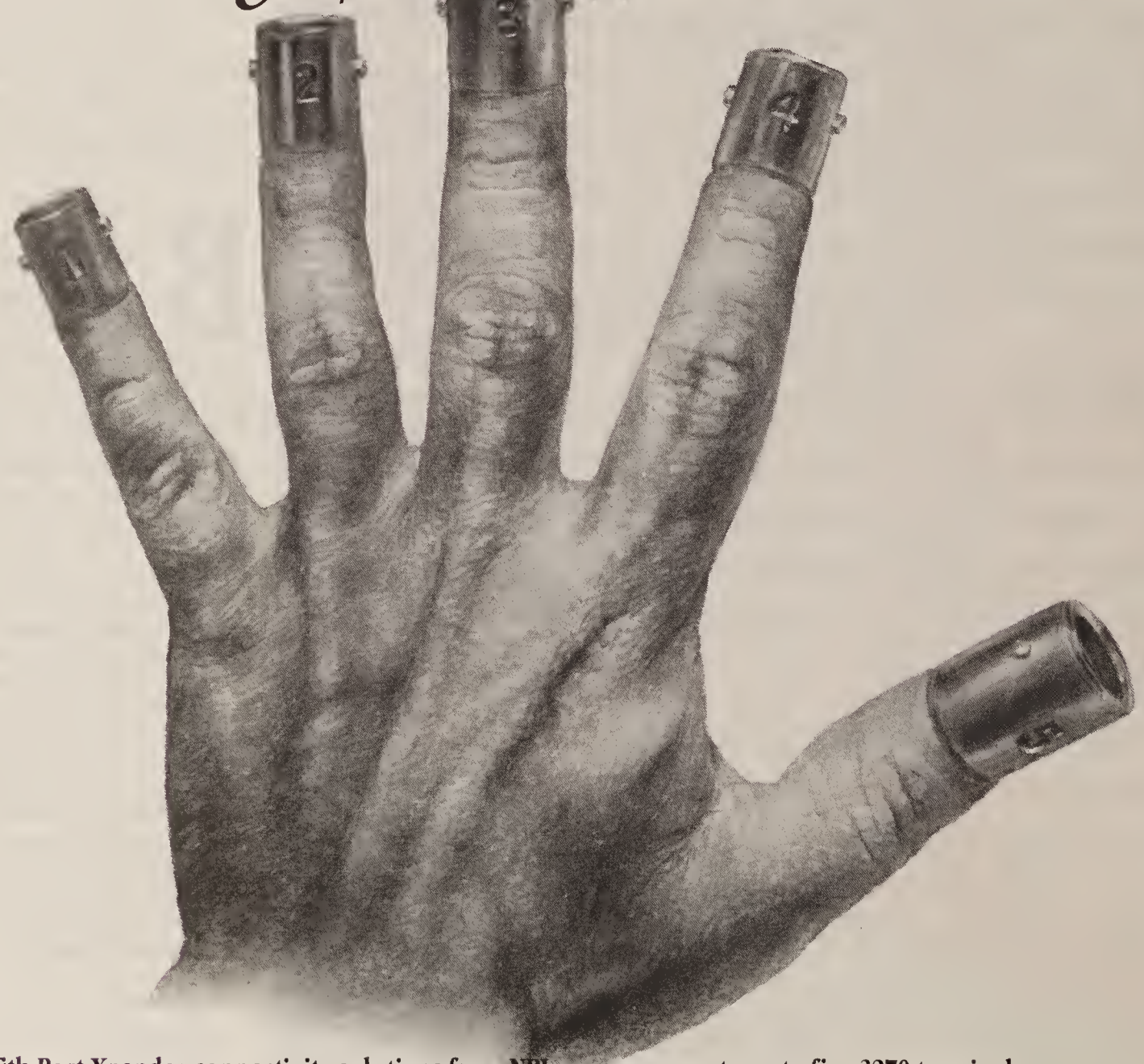

With Port-Xpandor connectivity solutions from NPI, you can operate up to five 3270 terminals, printers or PC's *simultaneously* through a single 3x74 controller port.

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If you're attaching PC's to the network, simply connect the PC to the Port-Xpandor 521PC using an existing serial port on the PC. *A 3270 interface board is not needed for the PC.*

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EXECUTIVE TRACK

Mike Hattery has been appointed vice-president of information services at **Adolph Coors Co.** in Golden, Colo.

Hattery is responsible for planning, control, development, implementation, support and operations of both IS and telecommunications. He was formerly director of IS at Ralston Purina Co. in St. Louis.

Hattery holds a bachelor's degree in mathematics/physics from Western Illinois University in Macomb, Ill., and a master's degree in business administration/finance from Xavier University in Cincinnati.

.....

Steve Adamson has been named acting executive director of the **Association for Systems Management (ASM)** in Cleveland.

He replaces David Sturtevant, who resigned earlier this year. The ASM executive committee is currently searching for a permanent executive director.

Adamson is an independent management consultant based in Fullerton, Calif. His 20-year IS career includes positions at Bank of New England; Pet, Inc.; Mars, Inc.; California Federal Bank and consulting work at Coopers & Lybrand.

Adamson was international president of ASM in 1987-1988. He was previously international secretary, vice-president, president-elect and an international director. He has been active in the Orange County, Calif., ASM chapter for 20 years.

.....

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Freeing the retail python

Mervyn's EDI implementation has improved inventory turnarounds, order cycles

BY CHARLES VON SIMSON
CW STAFF

Dennis Connors is charged with the dicey job of pulling a pig out of a python.

Connors is the vice-president of MIS at Mervyn's, the Hayward, Calif.-based apparel and soft-goods retail chain subsidiary of Dayton-Hudson Stores, Inc. The python is the retail product chain from vendors to distribution centers to retail outlets and out to customers. The pig is the buildup and shortage of inventory at different parts of the sales cycle.

The problem for Mervyn's was maximizing turns of inventory while ensuring that stores were fully stocked with fast-selling items at all times. In the highly competitive retail segment in which Mervyn's battles with the likes of K Mart Corp. and J. C. Penney Co. if customers do not find what they want, it is easy to head down the street to the competition.

"Mervyn's is in a fashion business. Their products have a rapidly diminishing life cycle," says Theodore Grossman, a professor of information systems and a specialist in retail technology at Babson College in Wellesley, Mass. Grossman explains that the average fashion item has a life cycle of four to six weeks, compared with 13 weeks a decade ago. Responding to rapidly changing demand is a critical competitive area.

Several years ago, Mervyn's store managers were told that performance would be measured by turns of store inventory 13 times per year, once every month and one additional time. "Being as sharp as they are, they would sell completely through the first turn of the month as quickly as possible," Connors says. "The logistics couldn't handle it."

CINDY CHARLES

Mervyn's Connors *has racked up performance gains*

The pig wedged firmly in the python was a stomachache for Mervyn's management. The company's fortunes lagged for several years after its acquisition by Dayton-Hudson Stores, until a turnaround effort began in late 1988. By the middle of 1989, Mervyn's posted a 13% sales gain at stores that were open more than 12 months.

However, two things had to happen together at Mervyn's to help boost profits while turning over merchan-

Continued on page 68

Ciba-Geigy prescribes a business/IS mix

BY JOSEPH MAGLITTA
CW STAFF

While many organizations give lip service to getting top information systems managers more involved in key business activities, Ciba-Geigy Corp. has done just that.

Last year, the Swiss-owned pharmaceutical and chemical firm began setting up IS groups within key divisions such as research, development, manufacturing and marketing. At the same time, the company retains a centralized IS department to handle traditional "back office" activities for the 4,500-employee operation.

Company officials say the two-pronged approach lets Ciba-Geigy apply IS power exactly where it is needed. Each department, they say, has the freedom to develop its own IS functions.

"It's a hybrid structure," explains Jack Feeley, director of marketing IS at the pharmaceutical division in Summit, N.J. "It's not one pole or the other, all centralized or all departmental. It's a mixture of both."

A 25-year IS veteran, Feeley occupies what is probably the hottest of the new departmental IS positions. Feeley, former divisional director of end-user support, assumed his new position last December.

He directs a 40-person staff and reports to the marketing director, who in turn reports to a senior vice-president of marketing.

Feeley's IS group is responsible for purchasing all syndicated data, building databases and all other applications for marketing.

The department has already played a major role in a strategic project, Feeley says, citing the automation of the 1,400-member field sales force. The project equipped the sales force with laptop computers for their "office on wheels."

A willingness to experiment with new organizational structures has allowed the firm to stay competitive with formidable rivals such as Eli Lilly & Co., Merck & Co., Johnson & Johnson and Warner-Lambert Co., although cutting-edge technology is not by itself a competitive edge.

"Sooner or later [competitors] all get the same technology and the competitive edge disappears," Feeley told attendees at the Info '89 conference in New York earlier this month. "Then you've got to move onto another area."

Feeley says that placing top IS people in the front lines also provides a new, exciting career path for seasoned IS employees who might otherwise become bored with more traditional placements. Successful as the move has been, Feeley cautions that the idea may not work as well in every company. "It depends on the culture of the organization," he says.

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Retailing

CONTINUED FROM PAGE 65

dise. The first was a new technology — electronic data interchange (EDI). The introduction of EDI in February 1987 immediately led to an increase in annual inventory turns of three to four times.

The second was a re-evaluation of the measures of different parts of the business — and an ensuing effort to make them more compatible.

"The inefficiencies of distribution can become a self-fulfilling prophecy," Connors points out. "Trucks don't move unless they are 90% full, so the stores were not selling their merchandise, because they were not getting it in time to meet seasonal or promotion-driven demand."

The technical challenge was to tie the entire chain — vendors, distribution centers, in-store point of sale, store buyers — using EDI. Each store has an IBM minicomputer which will soon be shifted to a Unix platform for added flexibility in linking disparate environments. Electronic communication replaced telephone tag, paper manifests and other unwieldy methods of transmitting information on what merchandise was selling fast and what was languishing on shelves.

Retail chains compete not just for customers but also for high-demand merchandise as well. "Basic supply is limited, you have to get as much information on test markets as quickly as you can, and then order a hot item while vendors still have it," Grossman says. "You have to dump the losers and stock the winners as quickly as possible."

The value of better sales data to Mervyn's suppliers cannot be overestimated, Connors says. "If you give information back to the vendor on what's selling, he can leverage that back to his suppliers," he says. "From a national perspective, with 1992 looming, it is clear that we have to enhance that process. Too few people understand the value chain."

The technological implementation proved to be the easy piece of the distribution equation. The more complex organizational response was to break down traditional efficiency measures and concentrate on moving the most profitable items. The simple nature of the changes belied the discipline necessary to attain them when managers and employees had grown so accustomed to the traditional measures.

"Sometimes we simply have to send the trucks 40% full," Connors says. "It looks like you are not using the trucks most efficiently, but you are getting goods to the customers. You have to look at the whole business as a set of congruent goals."

The critical result of improved inventory management is to add flexibility to store sales. Before implementing EDI, Mervyn's had a 10-week order cycle, meaning that it took 10 weeks between distribution center visits to get to a retailer. That meant that the distribution centers could only make five adjustments to stock per year. During those five adjustments, they had to make predictions on order patterns for the entire 52 weeks of the year. If red sweaters were a dog, they would sit on Mervyn's shelves while customers went elsewhere for the green sweaters that were all the rage.

"With EDI we have pushed that back to five-week cycles," Connors says. "We get to look at the stock 10 times per year. It is still not great, but it is better. We are pushing for a one-week cycle; we want to look at it 52 times per year."

Costs, of course, are another important measure, and with shorter cycles inventory costs go way down. "With a five- to 10-week cycle we have to hold [inventory] a lot longer, and that is expensive," Connors says.

The best inventory management retail chains, such as The Limited Stores, Inc., hold most stock less than 24 hours. "Their Columbus, Ohio, distribution center is truly a distribution center," Grossman says. "It is not a warehouse because things don't stay there. That is where the game is won and lost."

CALENDAR

NOV. 5-10

American Association of Equipment Lessors Convention. San Francisco, Nov. 5-8 — Contact: American Association of Equipment Lessors, Suite 1010, 1300 N. 17th St., Arlington, Va. 22209.

Computer Applications in Medical Care Symposium. Washington, D.C., Nov. 5-8 — Contact: SCAMC Office of Continuing Medical Education, The George Washington University Medical Center, 2300 K St. N.W., Washington, D.C. 20037.

Managing Apple Computers in Information Systems Conference. Dallas, Nov. 5-8 — Contact: MacIS, Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601.

Guide 75. Los Angeles, Nov. 5-10 — Contact: Guide Headquarters, Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601.

Decision Support and Executive Information Systems: A Managerial Perspective. Cambridge, Mass., Nov. 6-7 — Contact: Decision Support Technology, 125 Cambridge Park Drive, Cambridge, Mass. 02140.

The Executive Forum on Information Systems Management. Clearwater Beach, Fla., Nov. 6-8 — Vern Lautner, 135 W. 50th St., New York, N.Y. 10020.

Messaging '89. New York, Nov. 6-8 — Contact: Information Publishing Corp., P.O. Box 42375, Houston, Texas 77242.

On-Line Transaction Processing Symposium. New York, Nov. 6-8 — Contact: Digital Consulting, 6 Windsor St., Andover, Mass. 01810.

The Three Rs of Software Automation: Re-engineering, Repositories, Reusability. Nov. 6-8, Boston — Contact: C&F Management, Suite 402, 372 W. Ontario, Chicago, Ill. 60610.

(A) WY-3225, 25 MHz 386 as multi-user platform driving (B) WY-60 terminal, (C) WY-150 terminal and (D) WY-370 color terminal. (E)WY-3225 as LAN fileserver with (F) WY-2116 16 MHz 286 with WY-650 VGA color monitor, (G)WY-2112 12.5 MHz 286 with WY-700 hi-res monitor, (H) the Wyse Networker and (I)WY-3216 16 MHz 386 with (J)WY-7190 hi-res 19" monitor.

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BOOK REVIEW

A call to rediscover U.S. ingenuity and learn from competitors

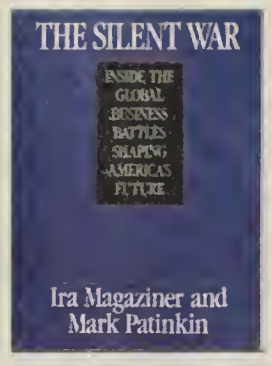
THE SILENT WAR
By Ira Magaziner and Mark Patinkin
Random House, $19.95

Despite illusions of prosperity, America's industrial and technological base — the source of our world leadership — is eroding, and companies too often are turning over the manufacturing to countries able to produce things better and cheaper.

In *The Silent War,* Ira Magaziner draws on 15 years of experience as an international business strategy consultant to explore the strategies behind successful companies. Journalist Mark Patinkin clearly was along to handle the writing chores, since the book is written from Magaziner's point of view. The book is set up case-study style, with each of the nine chapters devoted to a corporate triumph, whether overseas or in the U.S.

Many of Magaziner's observations are not new; the decline in U.S. industrial strength and the increasing capacity of foreign countries to outmanufacture the U.S. at a lower cost is a well-worn topic. But Magaziner's ability to make the people and projects come alive separates this book from many other treatments.

Each chapter is a tale of triumph and of the personal, corporate and even national determination to produce the best product, from refrigerators to jet airplanes, in the face of formidable obstacles. The heroes are the engineers — like Samsung's Yun Soo Chu, who designed the microwave ovens that catapulted Samsung to world leadership in microwave sales — and the visionaries, like Charles Lucy of Corning Glass, who saw fiber optics' potential before much of the world did.



These stories share common themes: the vision of someone who committed resources for investments in technology, training and factories, often when a payoff was not expected for years.

Unfortunately, the foreign triumphs outweigh those in the U.S. All too often, U.S. business is driven by a short-term outlook, and firms farsighted enough to invest heavily in research and development at the expense of lowered short-term profits become the target of takeovers. But the U.S. can fight back, Magaziner says, by capitalizing on what has always been its strength — innovation — and by adopting some of the business models pioneered by our foreign competitors.

Magaziner advocates a new role for government, that of partner with business. While the U.S. government spends billions on defense-related research, there is little emphasis on the commercialization of products. In contrast, foreign governments have taken on a strategic planning role, targeting important industries and working with business to nurture them.

Another point the authors bring home is the investment many countries make in their work force, empowering their hourly workers with the skills and motivation to achieve. Take Singapore, for instance. A tiny country with few natural resources, its government has decided that its people are the key to its success and has set up an extensive training network.

These days, advanced technologies often require a lead time of a decade and millions of dollars in R&D before a technology reaches commercialization. The authors argue that companies can no longer do it alone. The scale of investment requires new ways of doing business; ways in which many other countries are already operating. One example is the European Airbus consortium, a venture initiated by the French, West German and British governments to build commercial jets. This pooling of resources enabled Airbus to penetrate and become competitive in an industry in which a single country or company might not.

If the U.S. is to be a player in emerging industries, the authors argue that it must adapt some of these foreign models to its way of doing business. They point to examples of encouragement, such as the U.S. government-business joint venture in and the increasing awareness on the part of U.S. business executives to admit the challenge from foreign competition.

The battle lies ahead. Again and again, Magaziner recounts experiences in which he tried to persuade American business executives of imminent dangers, only to have the warnings fall on deaf ears.

Despite a fair amount of patting himself on the back for recognizing these truths when others could not, Magaziner manages to avoid sounding smug. And having worked with some of the world's largest companies, the author does have some valuable lessons to convey.

The lessons are driven home with style. As each tale unfolds, you may find yourself wanting to cheer when Chu's assembly line cranks out its first microwave or when General Electric engineers complete the job that others said couldn't, and shouldn't, be done. Magaziner's insights are timely, relevant and recommended reading.

AMY CORTESE

Cortese is *Computerworld's* Mid-Atlantic correspondent.

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Top 10

FROM PAGE 1

faculty is led by Sloan School of Management MIS group Chair Stuart E. Madnick, who has a background in computer science and who is working on improving the semantics of data. The director of the Center for IS Research is John Rockart, who pioneered the concept of "critical success factors."

Another prominent member is John Henderson, who is breaking ground in the area of the strategic alignment of IS and business functions. Randall Davis, associate director of the MIT AI Laboratory, is also on the IS faculty. A new Center for Coordination Research, headed by Tom Malone, who holds a Ph.D. in psychology, is the first technology research program formed around both organizational and group interaction.

"We provide students with a depth of technical knowledge so they know what they're talking about," Madnick says. They also have a sense of how technology fits into the organization and where the business is trying to go."

The Cambridge, Mass., school received the highest marks (ranking 8.48 overall out of a possible 10 points) for the ability to place students in high-level IS positions and for the quality of its research programs (ranking 8.65 out of 10). MIT's prominent graduates include Citicorp's chairman John S. Reed.

"MIT has been known for its technology and its management training, but not really for IS. But now as technology is changing the way business operates, you can no longer draw a clear line between those two areas," says Joseph W. Alsop, president of Progress Software and an MIT graduate.

retical teaching.

The program's 18 faculty members also work as consultants in IS. "Our faculty's strength is that they are doing professionally what they are teaching in the classroom," says James A. Senn, chair of the Computer Information Systems Program.

MIT Sloan School *of Management's Madnick*

Rated first by the survey respondents for partnerships with businesses (scoring 8.48), Georgia State, in Atlanta, works closely with local companies.

"We have people in our courses who are working on the reservation system at Delta or on Coca-Cola's global marketing system or Georgia Pacific's worldwide system. It's a constant interchange of ideas with people in the courses and in work environments," Senn says.

UNIVERSITY OF MINNESOTA

The focus of the University of Minnesota's program has shifted over the years from training graduates strictly for leadership positions within IS to teaching students the skills they need to work in user organizations. The school is in Minneapolis.

"We are now allowing sufficient latitude so that people can look at a broader set of activities," says Carl R. Adams, who chairs the Information and Decision Sciences program.

This shift is reflected in the faculty, which now includes professors with technical, organizational and strategic expertise. One of the more widely known faculty members is James C. Wetherbe, who, after staking out the leading edge in system development, is now focusing on the strategic positioning of IS within organizations.

Wetherbe heads Minnesota's MIS Research Center, which, along with the IS doctoral program, is the oldest in the country.

NEW YORK UNIVERSITY

According to Information Systems Area Chair Edward A. Stohr, NYU's major strength is the youth and diversity of the faculty. *Computerworld* survey respondents agree with Stohr, giving NYU's faculty the highest rating — 8.26 — among the top 10 schools.

"We hire computer science people as well as management and behavioral scientists," Stohr says. "This multidisciplinary focus brings balance and is reflected in the teaching programs. We are educating people for management positions that are very broad in scope."

Alan Lum, a current NYU student chose the program, which is housed in the Leonard A. Stern School of Business, for its courses. "I was looking for the program with the most varied curriculum in breadth and depth."

UNIVERSITY OF CALIFORNIA AT LOS ANGELES

One of the least-structured MBA programs in IS is offered by UCLA's John E. Anderson Graduate School of Management, where IS is one of 12 fields of concentration open to students.

"We've been changing over time," says Lewis Leeburg, a lecturer and director of the IS research program. "Early on, the emphasis was on technical subjects, particularly systems development. In the '80s, we started to be more concerned about some of the strategic issues."

The successful development of the program as a prominent force in IS education is attributed to Professor Ephraim McLean, who left UCLA two years ago and now holds the George E. Smith Eminent Scholar's Chair at Georgia State University. An MIT graduate, McLean spent 18 years building the UCLA program.

E. Burton Swanson, the current program chair, and Professor Lynne M. Marcus brought an organizational approach to the school in the 1980s. Since then, the focus has shifted to the strategic and organizational aspect of information systems.

UNIVERSITY OF ARIZONA

Known for its technical focus, the University of Arizona's program is seen as the best place to obtain high-level systems training. "Our biggest strength is that we get students involved in real projects," says Jay Nunamaker, the Chair of MIS in the College of Business and Public Administration in Tucson. "We get quite a bit of funded research, and our students participate in developing software or some aspect of managing the process.

Georgia State University's *James A. Senn*

"When they go out interviewing for jobs, they can describe something that the IS manager can really relate to."

AU graduate Barbara Zukerwise benefited from this approach. "The program was very technical, and it put me in very good stead compared to a lot of other graduates who have almost no technical background. If you look around, it's the people with some technical background who move up in this organization," says Zukerwise, now a senior product manager at NCR, in Columbia, S.C.

INDIANA UNIVERSITY

The highlight of the Indiana University IS program is the final course, a field project in which students work in teams of three in companies such as Eli Lilly, Owens Corning Fiberglas and Procter and Gamble.

"They work on a systems project under the supervision of a faculty member and the client organization. This course really ties together the rest of their educational background and gives them a jump-start on their careers," says Jeffery Hoffer, head of Indiana's IS program.

Vincent A. Mabert is chair of the Operations and Systems Management program in the Indiana University School of Business, in Bloomington, and Hoffer is responsible for the IS portion of the curriculum.

Unlike some of the other programs that deal strictly on a conceptual level, the school offers a hands-on approach in system analysis and design. Students use commercial software like Accelerator, SQL/DS, and Ingres, to gain an understanding of how to manage technology.

UNIVERSITY OF TEXAS AT AUSTIN

Offering a comprehensive program is the focus of efforts at the University of Texas. In addition to an MBA concentration in IS, the school offers a highly structured program called Information Systems Management.

ISM utilizes a new facility, called Classrom 2000, a laboratory/classroom containing 32 IBM Personal Computer ATs running graphics and communications program designed for the ISM curriculum.

"Our intent is to balance the management issues and technical issues but focus on the use of information systems in organizations," says Management Sciences and IS Department Chair Eleanor Jordan.

UNIVERSITY OF PITTSBURGH

The focus of the Pittsburgh program, says IS Chairman William R. King, is to give students the opportunity to get an MBA and an MS in IS. The programs are housed in the J. M. Katz Graduate School of Business.

Pittsburgh is also "information-intensifying" the MBA program, King says. "Our notion is to focus on the issues of problem-formulation and identification in all the areas of the MBA, more than problem-solving," he adds.

The only program without a center for IS research among the top 10, Pittsburgh has one of the strongest doctoral and research programs in the country, rated with a score of 8 by survey respondents. Rather than a single program, the school's research efforts are dispersed throughout the department.

UNIVERSITY OF GEORGIA

Though smaller than MIT or NYU, the University of Georgia in Athens also provides a multidisciplinary approach to IS in its Department of Management.

"One of the attractive aspects of our program is that we have tracks to train IS specialists as well as sophisticated users or IS professionals to work in user areas," says Professor Robert P. Bostrom.

The University of Georgia program, chaired by Hugh Watson, is housed in the Department of Management. This stresses the need to integrate IS with other disciplines. "It's a very collaborative atmosphere," Bostrom says.

Rating the top 10 IS graduate school programs

Below are the mean scores of a survey of 250 IS educators, executives and recruiters. Respondents ranked the schools based on the following scale: 1 = poor, 10 = excellent. Schools that received less than 15 responses and those that do not have a concentration in IS were not ranked.

School	Overall rating	Placement ability	Course quality	Research support	Faculty depth	Business partnerships
1 - MIT	8.25	8.48	7.72	8.65	8.12	8.29
2 - Georgia State	8.09	8.18	8.14	7.87	7.77	8.48
3 - U of Minnesota	8.08	8.00	7.64	8.23	8.22	8.29
4 - New York University	8.05	8.00	7.92	8.19	8.26	7.89
5 - U of California	7.97	8.36	8.05	8.32	7.50	7.63
6 - U of Arizona	7.94	7.66	7.82	8.34	7.81	8.05
7 - Indiana University	7.86	7.92	7.87	7.97	7.83	7.71
8 - U of Texas	7.84	7.78	7.96	8.33	7.75	7.38
9 - U of Pittsburgh	7.73	7.71	7.86	8.00	7.60	7.50
10 - U of Georgia	7.03	7.25	6.92	7.25	6.75	7.00

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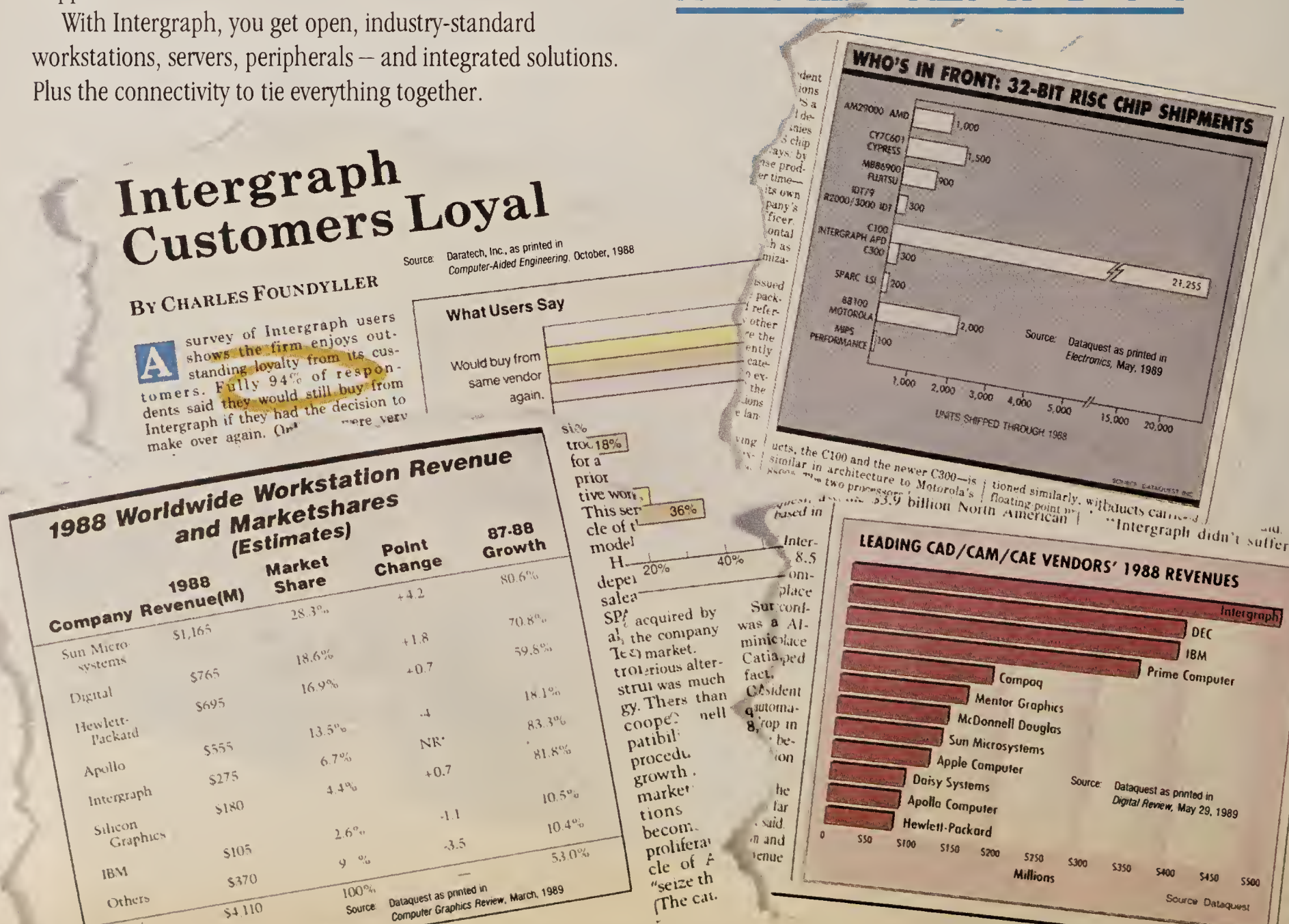


THE UNIX MARKET

Unix and the swarm toward openness

BY DANIEL GROSS

After years of sideline obscurity, the Unix operating system has finally managed to gain a hold in the mainstream of corporate computing. That hard-earned progress is threatened by competition on two levels, however. Internal standards squabbling is frustrating users at a time when proprietary systems are moving aggressively to appropriate the concept of interoperability. Even the most entrenched vendors, such as IBM, are offering open-system connectivity to their still-closed networks and operating systems.

Unix spawned the philosophies of portability, connectivity and hardware independence that are now grouped under the banner of "open systems." Vendors have been maneuvering in complex patterns, all waving this banner, to ensure maximum overlap of new standards and open-system specifications with their own intellectual property.

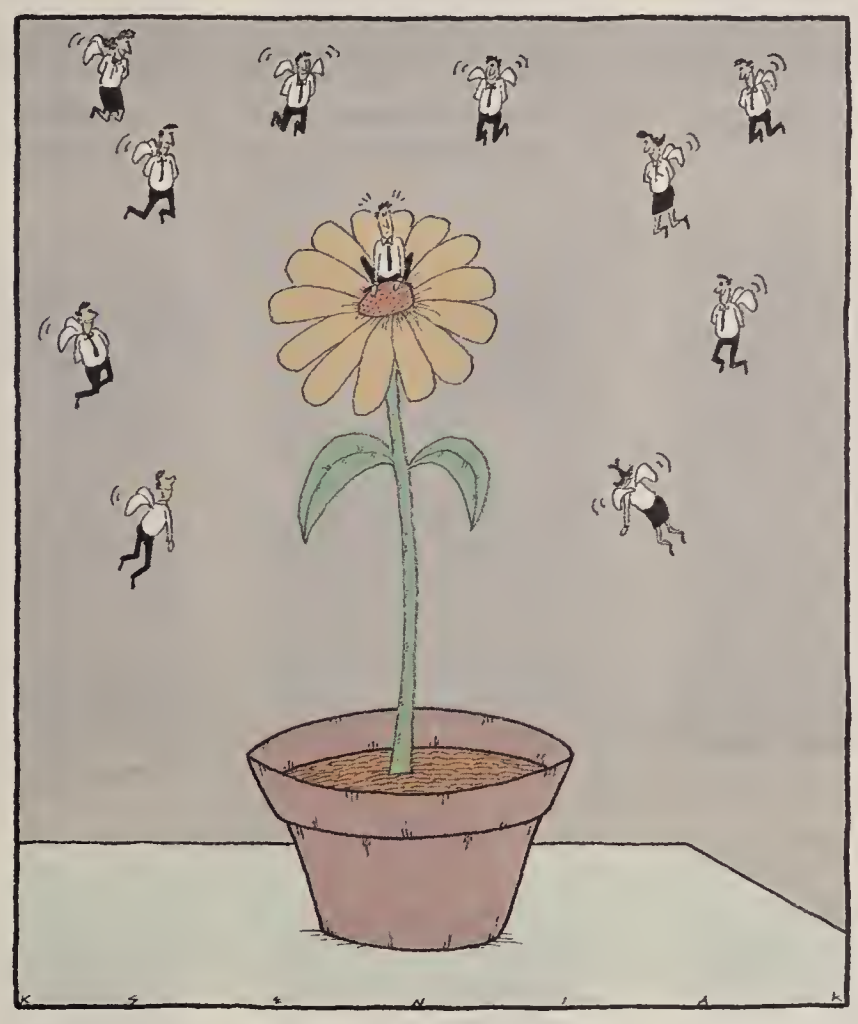
If it were not so frustrating for users, whose strategic information systems investment decisions are blurred by the dust of the battle, this game of politics would be downright entertaining. But the plethora of proposed standards for Unix pleases no one.

"I find this an endlessly irritating subject," says Amy Wohl of Wohl Associates, a consulting firm in Bala Cynwyd, Pa.

The ostensible object of the game is simply defined. A computing system may be deemed "open" if all functions of its levels of communication with foreign objects — applications programs, I/O channels and storage and peripheral devices — are specified and made public.

Consistent and documented access to all its resources gives users a chance to expand and adapt the system, even if the system itself is proprietary.

The next trick is to reach an industrywide consensus on these specifications.



MARK KSENIAK

The Open Software Foundation (OSF), a consortium of 150 vendors headed by IBM and Digital Equipment Corp., is seeking to establish industry standards that would prevent AT&T from continuing to write the history of Unix on its own. All but two Unix-compatible operating systems on the market today are AT&T-licensed.

The exceptions are IBM's AIX and Carnegie-Mellon University's Mach. The OSF plans to release OSF/1, its alternative to Unix, sometime in the near future. But there is still contention within the OSF on whether the core system functions — known as the "kernel" — will be taken from AIX or Mach.

In the spirit of "seeing is believing," the first product announced by the group was OSF/Motif, an X Window System-based graphical user interface. X Window is a public-domain interface developed at MIT under Project Athena. The project, which many of its participants thought was technically misguided, was launched with joint funding from DEC and IBM. Generally speaking, the OSF seems frequently indecisive as a result of its members' reluctance to lose any proprietary edge.

AT&T, for its part, has led the creation of Unix International, with 80 corporate members and a mandate similar to the OSF's but based on the AT&T Unix System V standard.

Another vendor group, X/Open, has both DEC and AT&T in its ranks and has gained respect among analysts and large Unix users as a relatively objective vendor group.

Armed with advertising and publicity, the three major groups have claimed roughly the same turf in the open systems debate, offering incomplete explanations and vested-interest justifications for their participation.

Collective mediocrity

"Anybody who does anything except listen to the market will be disappointed," Wohl says. "I think consortia are very nice, but I'm always distrustful of technology-by-committee, and I'm cynical about mutual efforts by competitors. You don't get brilliant creative work that way. That usually happens in the middle of the night in some small company. Consortia produce middle-of-the-road products."

Actually, except for the OSF, no one is making a significant effort to reinvent the wheel of Unix. "Despite the noise made by DEC, IBM and HP, over 70% of users still get their Unix System V from the AT&T channel," says Bill Keating, director of technology marketing at Sun Microsystems, Inc. and a board member of Uniforum, the largest Unix user group (formerly /usr/group). "And OSF has yet to ship any product."

In Keating's opinion, "AT&T has done very well to dramatically reduce the fragmentation in the number of versions of Unix, to a point where the market is now only polarized between the Unix International and OSF camps. It is possible that AT&T and the OSF will resolve their differences, and we'll have one Unix, finally." (Rumors of such a pan-industry alliance abound, but AT&T and OSF deny them.)

The question then becomes,

Gross is chairman and co-founder of Magnetic Press, Inc. in New York.

INSIDE

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Product Face-off X.Desktop and Looking Glass: Visual guidance for users. Page 83.

On the Edge With Posix on the way, real-time Unix gains prospects. Page 84.

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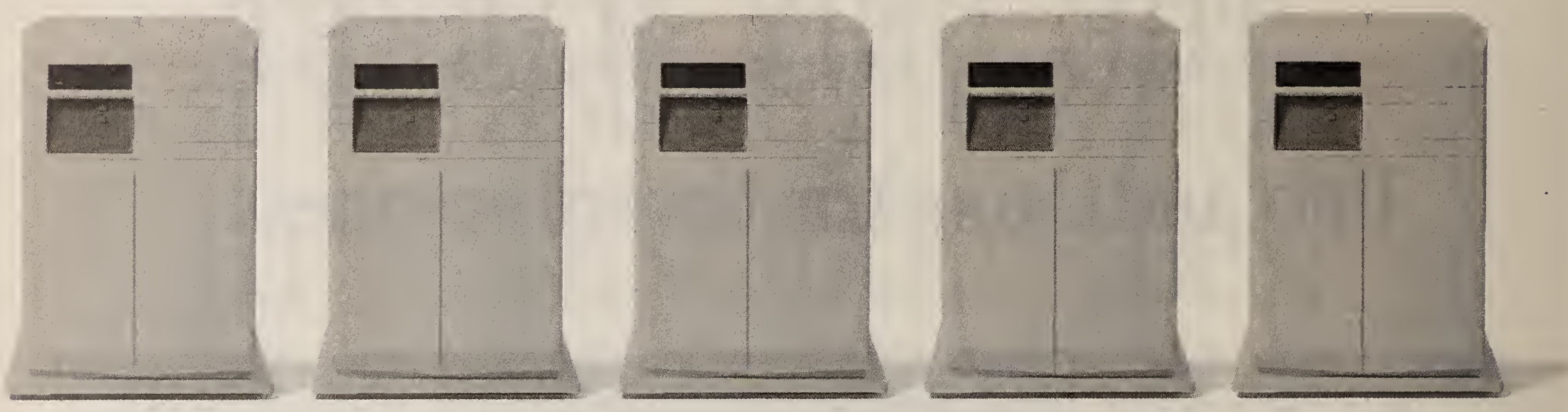

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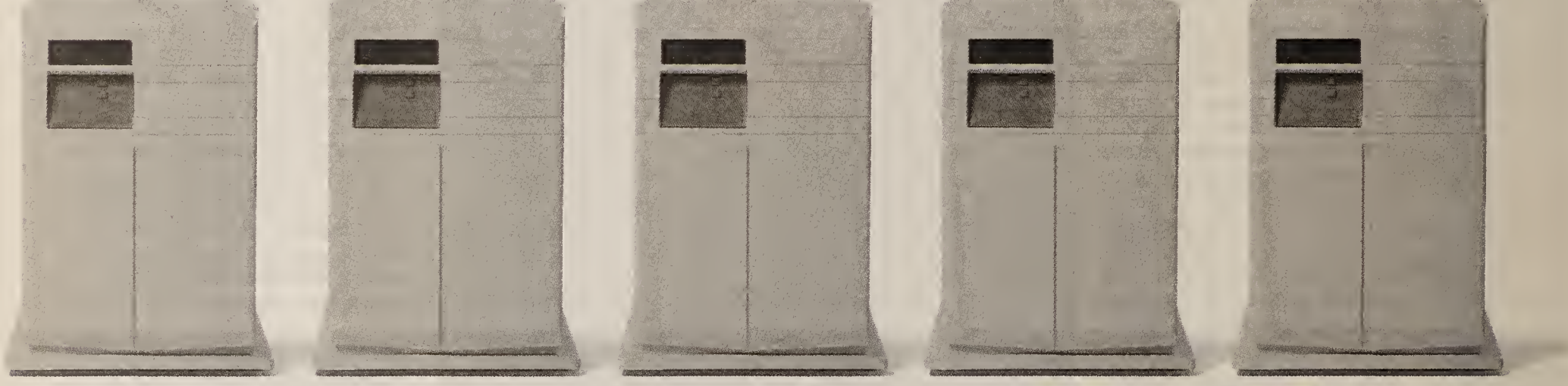

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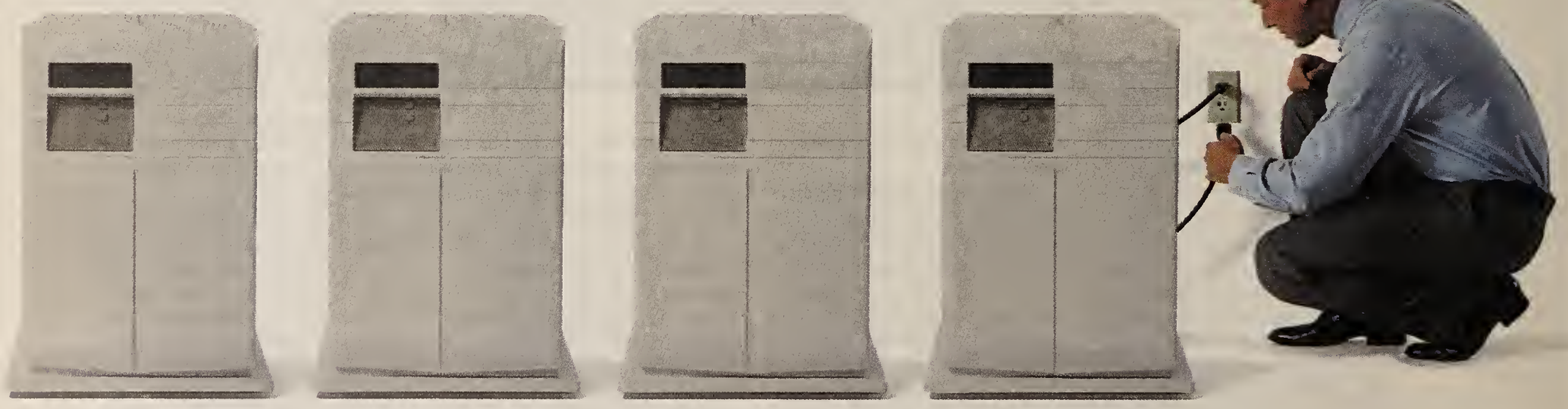

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Openness

FROM PREVIOUS PAGE

how significant would such a universal Unix be in a marketplace still dominated by proprietary, yet increasingly interoperable, operating systems?

Reincarnation

Some feel Unix itself is no longer an essential component of the open systems trend it helped to start. "Who knows what Unix is anymore? In a previous lifetime, I supported the Unix kernel, and now Unix is five or six times what it was years ago. Once you have an API, who cares what you call what's underneath? Unix? Posix? Who cares?" asks Mitch Bishop, director of Unix marketing at Relational Technology, Inc., makers of the Ingres relational database.

API, or Application Programming Interface, is the keystone of open systems design. The notion of an API is to make the modular components of any application — from communications software to database managers — available to other programs through a clearly defined set of functions. Programs designed to use a particular API can be oblivious to the underlying operating system.

This approach has led to two powerful developments in proprietary yet technically "open" computing. On one hand, entrenched vendors, especially IBM and DEC, offer gateways or standard interfaces to proprietary networks and systems. IBM, for example, now offers a gateway from Transmission Control Protocol/Internet Protocol, the favored network among Unix users, into its own Systems Network Architecture. And DEC has plans to make Decnet comply with the Open Systems Interconnect standard and already offers an X Window interface for DEC VMS users.

On the other hand, database software vendors have taken it upon themselves to provide a uniform layer spanning a variety of operating systems and customer applications. Oracle Corp.'s Oracle database manager, for example, runs the same applications on systems operating under DOS, Macintosh, Unix, VMS and other operating systems. The Oracle language itself is, indeed, proprietary.

Of course, the latter development can also work to the benefit of Unix. Historically, the key to an operating system's success has had more to do with its base of available applications than with its technical excellence. But with open systems, the requirements of connectivity, interoperability and simple data interchange between applications increase the demands made of the operating system itself. Unix has had that next-generation functionality for many years but lacked the applications base.

"The market has a delicate balance between price and functionality," says Mark Finley, an analyst at Gartner Group, Inc. in Stamford, Conn. "Many times, the proprietary system delivers the one function you just have to have, and that alone is worth double the price. But in time, that seems to work its way into an environment where it is part of the open system. That's what has been happenning to VMS lately, which has been used for DEC's All-In-1, RDB, Ingres or Oracle. But now that you can get Unix with a nice shell on it running the same products, you wonder, why did I pay five times as much? These database managers cover a lot of the flaws in Unix."

Developmental elegance

Furthermore, from a developer's point of view, Unix offers more efficient and elegant API implementation than any other operating system on the market.

"As far as functionality goes, it's really a very elegant system," says John Bailey, who manages information systems at the University of Tulsa.

Development elegance is not the only reason Bailey likes Unix, however. To him, he says, it still seems like the best means of keeping his fate separate from that of his vendor. "I expect we'll see a major restructuring of the computer industry in this country, and though I'm very pleased with the systems we have, I don't want to be locked into any vendor. I want to keep my options open," Bailey says.

There's another factor working in favor of Unix, Wohl says, and that is a strong demand for Unix in Europe. Europe is roughly two to three years ahead of the U.S. in commercial penetration of open systems implementation and thus serves as a useful litmus test of the viability of Unix as an open systems platform.

An international user base conforming to common interface standards will help spur commercial applications developers.

The commercial viability of Unix has already been helped by the arrival of DOS emulation products, which allow Unix users to tap into the massive existing base of PC software. It is now possible, for example, to run Lotus Development Corp.'s 1-2-3 and other typical PC applications as a subtask of Unix-based PCs. This smooths the migration path for those still waiting for their favorite applications to run directly under Unix.

One thing that DOS has always had going for it that Unix has not is its confinement to a single microprocessor standard. The DOS community never had to worry about things such as binary standards, but in Unix, wide-ranging variations in systems design have resulted in disconcerting situations in which different Intel Corp. 80386-based workstations, for instance, running Unix versions from the same source, required different versions of executable files for the same application.

"The marketplace is growing fast, sure, but not as fast as it could if there were reasonable binary standards," Bishop says. "With the Intel 80386 and 80486, a binary standard is emerging. I think there will be a coalescing around a few architectures: Intel 80X86, Sparc, Motorola 88000, MIPS. My feeling is bigger players will remove nonstandard RISC architectures. DEC has gone with MIPS, and Pyramid has gone with MIPS. There's hope for binary standards."

If Bishop's predictions come true and binary standards emerge, economies of scale for software developers will create an increase in lower priced, off-the-shelf applications.

Graphical standards

An even murkier issue, in part because it is the focal point of most of the political maneuvering among vendors, has been the standardization of graphical user interfaces. Five contenders, all supported by mighty patrons, currently share the field: MIT's X Window System interface, which is in the public domain; OSF/Motif; the Open Look specification supported by AT&T, Sun and Hewlett-Packard Co.'s Apollo division; Sun's Postscript-based News; and Nextstep, another Postscript windowing system bundled with the Next workstation.

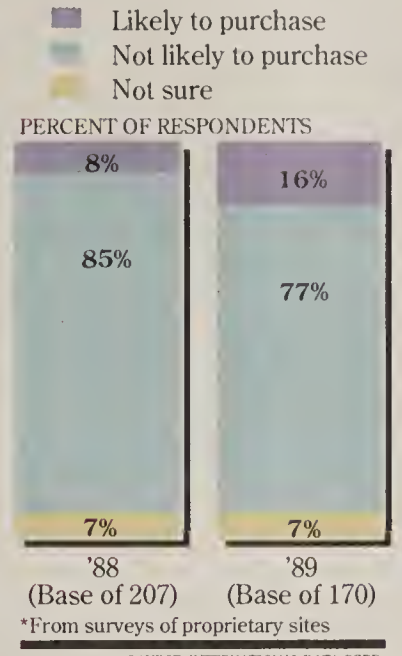
The irony is that while user interfaces are literally the most visible part of the open system debate, their lack of standardization is not a major obstacle to interoperability.

The interface to Unix functionality itself is the heart of the problem. Two main interface standards exist: AT&T's Unix System V Interface Definition, and Posix, originally part of the Federal Information Processing Specification (FIPS), now in the process of industrywide certification by the IEEE.

The Posix standard may both

Growing commitment

This year, twice as many minicomputer sites are looking favorably at Unix



*From surveys of proprietary sites

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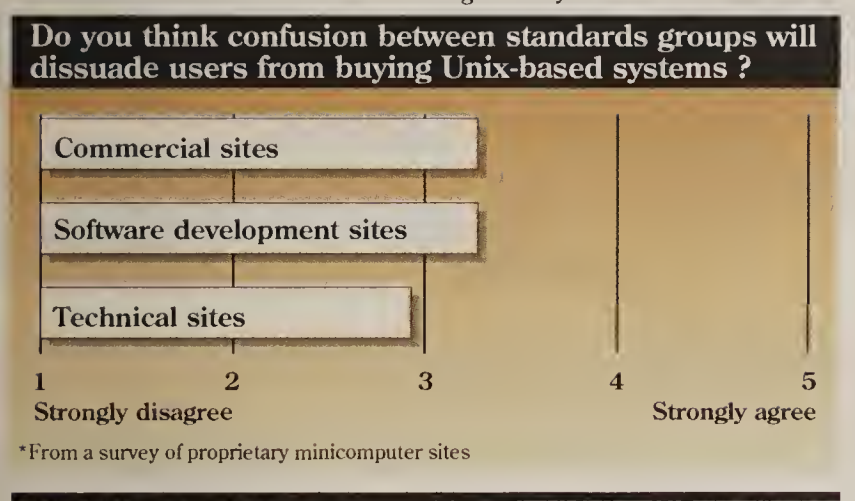
Stymied by standards

*Commercial sites and software developers are more likely than technical sites to see standards battles as inhibiting Unix's future**



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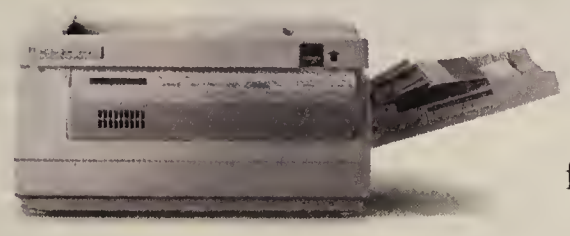

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hurt and help AT&T: hurt, by providing a third-party definition to which vendors can conform without licensing code from AT&T; and help, because the specification is derived from the SVID and is thus a tacit endorsement of Unix as the government standard.

The lost micro moment

In the government, thirst for personal computers combined with the need for multitasking and communications have worked strongly in Unix's favor. That is less true in the commercial world, where the same forces have motivated the development of OS/2.

AT&T's failure to effectively promote the use of Unix on PC platforms may have definitively closed a major window of opportunity to establish Unix as the micro multitasking standard. "If you think that Unix is going to displace OS/2 as a PC operating system, you're kidding yourself," Wohl says. "It could have had that role; for some reason, it doesn't seem to have achieved it."

Still, it is very likely that Unix and OS/2 will coexist amiably and productively in many corporate networks. "If we look at the initial success of Unix vs. OS/2, Unix has had much more market growth in the cooperative processing marketplace," says Ron Lachman, executive vice-president of Interactive Systems Corp., a Santa Monica, Calif.-based division of Kodak that relicenses Unix from AT&T. "The client/server model has its largest base of acceptance in the Unix marketplace," he says.

While both OS/2 and Unix implement client/server models and extensible architectures, OS/2 heavily favors local-area networking environments; Unix is equally comfortable with the more traditional host/terminal topology as well.

"Of course OS/2 will do well," Lachman says. "But not everything supports LAN Manager, and clearly, Unix has a head start."

The two key issues in open systems networking are distributed data management and distributed data processing. When industrywide standards emerge for transparent sharing of data and computing power over heterogeneous networks, then the mandate of open systems will be fulfilled. The front-row candidates for distributed data and distributed processing standards are Sun's Network File System (NFS) and Apollo's Network Computing System (NCS), respectively.

NCS is the most widely accepted protocol for Remote Procedure Call, the set of functions that make distributed processing possible in a Unix system. While it has a lot of de facto momentum, it has yet to be rubber-stamped by a formal standards organization. NFS, already a very popular extension of many Unix installations, will be an integral component of AT&T Unix System V, Release 4.

Because Unix is in the eye of the open systems storm, its market development has been bogged down with many issues ultimately unrelated to Unix itself. The debate over user interfaces, for instance, spans all operating systems.

Whether the Unix market continues to grow at its current 25% compounded annual rate or not, the operating system's principles of openness make it a safe investment.

More than a technology, Unix has become a model for extensible information systems. Vendors may fight over ownership of the technology, but the model has already benefited even users of proprietary products. Whether these benefits will continue to come in a package labeled Unix will do little to change the game, or the players. •

ASK THE VENDOR

We are using SI, Inc.'s MCS-3 management system, which supports Altos System V/386 Version 5.3. How can you bridge data that is in MCS-3 to other application programs, and how can you bridge other programs to MCS?

Claudia Trapassi
Director of MIS
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Typically, a user would have to build a file, using an editor, word processor or other program to the exact format that MCS-3 expects. SI, Inc. will gladly supply that format on request. If you are able to program in Cobol, it is possible to write a program that selectively adds to the MCS-3 files. We have written such programs, but they are not of general use to the public.

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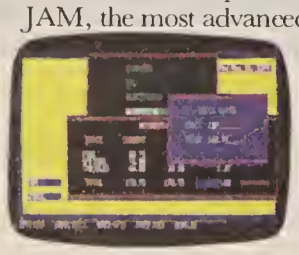

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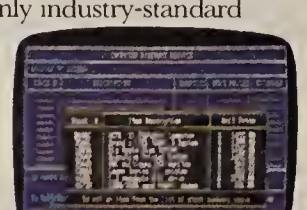

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Can a Unix system really be trusted?

BY STEVE SUTTON

Many people think all there is to making Unix secure is fixing the little problems that give the operating system its reputation of being as leaky as a spaghetti strainer. Unfortunately, the problem involves more than a scrubbing of code that was originally designed with little thought for security. It requires significant additions.

These additions have been a long time coming. Part of the problem was that the term "secure" is a lot like "high performance" in that it is meaningless without a qualifier. Until the U.S. Department of Defense (DOD) established a working vocabulary in 1984 with its DOD Trusted Computer Systems Evaluation Criteria, or Orange Book, no one was quite sure where to begin.

The Orange Book establishes the features and assurance characteristics of DOD trusted operating systems, rating them on a progressive scale of classes that ranges from C1 (least secure) to A1 (most secure). An agency of the DOD, the National Computer Security Center, evaluates candidate systems and assigns the class rating.

The C classes can be thought of as "security enhanced" systems. While such systems offer some security protection, they really cannot be considered "secure" in the common use of the term and would be of little use in malicious environments. Standard Unix systems are probably C1, although this has never been tested. The addition of a security audit trail takes Unix to the C2 level. By contrast, the B3 and A1 classes can be considered "extremely secure," but few users really need or can afford this level of protection. This leaves B2, which can be considered "tightly secure," and B1, which can be characterized as "secure," but not tightly so. Class B1 is a good start for users who want significant security protection, and B2 will serve them well for a long time to come.

Adjusting expectations

Orange Book-flavored versions of Unix are on the horizon. They took so long because early customers demanded the most secure systems, typically B3 or A1. These systems were too expensive, and the market for them too thin, to support more than specialty product suppliers. Today, however, customer expectations and the industry's ability to provide security in mainline Unix systems seem to have met at about the B1 level, where there is much activity.

Virtually every major Unix vendor now has a "secure Unix story" that inevitably includes Orange Book compliance. There is a strong IEEE Posix effort, which is solidly supported by the National Institute of Standards and Technology to define Orange Book-inspired extensions to the current Posix standards.

In 1986, Gould's UTX/32S, a C2 system, became the first full Unix system to complete full DOD evaluation. AT&T Unix System V/MLS should soon become the first to achieve B1. There are several other Unix products in evaluation at C2 and B1 levels.

Two significant systems are testing the even-more-stringent Class B2 barrier. Trusted Xenix, originally developed by IBM and now being further developed and marketed by Trusted Information Systems, has been in the making for some time. The second contender is AT&T Unix System V, based on Release 4.0. Both are wrestling with the very difficult "modularity" criterion of B2. Basically, B2 requires that

Sutton is a consultant specializing in secure systems. He is based in Urbana, Ill.

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the trusted software be internally "modular," which, at the very least, entails a significant restructuring of the standard Unix kernels.

Security at a cost

Some major Unix vendors are now producing their own versions of secure Unix. However, adding Orange Book features is expensive. Cost estimates of 25 man-years for B1 are common.

Until a new class of product — trusted Unix "extension packages" — came along about a year ago, few vendors could afford that kind of investment in the face of an uncertain market. An extension package is the code, documentation and, commonly, evaluation support materials needed to achieve a particular Orange Book rating. These packages, designed to integrate into the standard versions of Unix, have been a major factor in boosting the availability of secure Unix systems.

Because they still represent a significant enhancement to Unix, these packages are targeted at Unix vendors rather than end users. Extension packages also tend to target C2 and B1 levels because the B2 modularity criterion is difficult to implement as an extension package.

Over the next few years, several major Unix vendors will offer standard secure Unix systems based on the Orange Book. C2 will be common but will become a "positive but minimum" approach. B1 will also be common and generate significant attention. B2 systems will be rare. B3 and A1 will still be confined largely to specialty products.

The invasion of security into modern graphics interfaces is also inevitable. The Defense Intelligence Agency has defined a graphics workstation standard — Compartmented Mode Workstation — that is closely aligned with the Orange Book and for which several companies are building workstation products.

Sagging security

Unix network security is, regrettably, lagging. Most Unix systems under evaluation minimize or omit their networking components. Networking security is just a younger field and more difficult. Usable forms of networking security will emerge over the next few years, but slowly. Another development that will represent a major advance in the overall usability of secure Unix systems but remains quite a way off is the creation of trusted application programs that build on the secure operating system base. There are two potential categories of trusted application programs.

One category consists of programs with significant internal security properties that could be synchronized to those of the underlying Unix system. Several recently announced relationships between database vendors and secure Unix vendors offer some promise of progress in this area.

The second kind of trusted application needed to make secure Unix fully useful would consist of programs that offer no particular security features but have been adapted to avoid being crippled by the strong protections of the secure operating system.

The first versions of the trusted Unix systems will be like prototype crash protection vehicles. Big, strong and heavy, they will offer significant protection but will not be easy or economical to drive and may not even get you where you want to go.

Some of these deficits can be minimized. One way is to make sure that you check just how much the addition of security features has altered the functionality of the Unix system under consideration. It isn't really hard to make Unix secure. What is hard is to do that and still keep it Unix. If a system is secure but won't allow existing software to function, it won't be of much use.

Nothing in the Orange Book or other such standards precludes a vendor from providing ample backward compatibility or fully supporting the current look and feel of Unix (such as it is). In fact, secure Unix forums such as Posix seem to be committed to this goal. The problem is that some vendors simply find it easier to remove Unix procedures than to make them work with new security features. •

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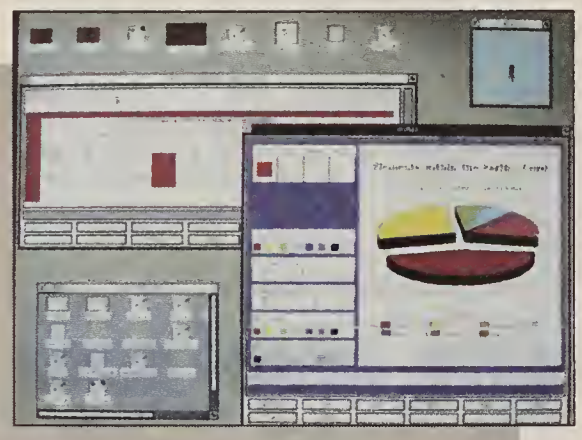
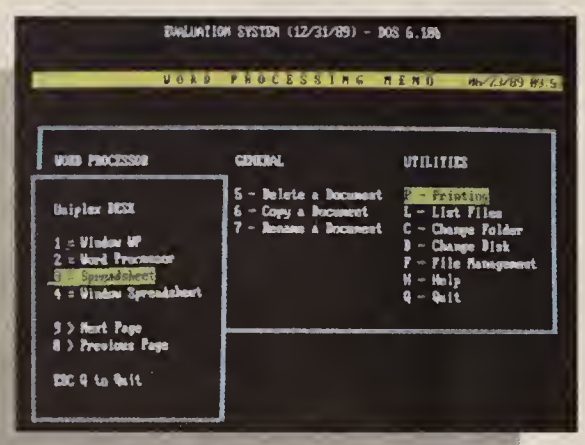
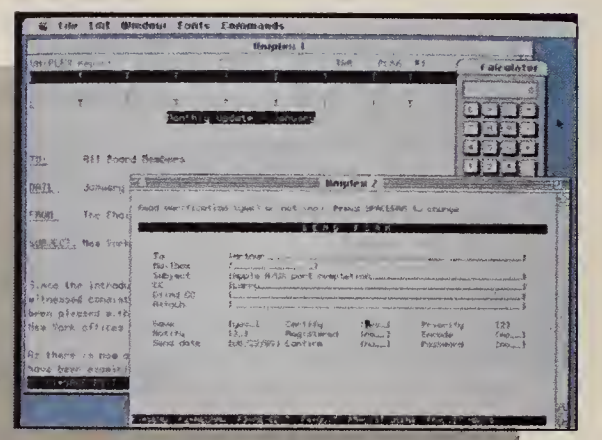


X Terminal or Unix workstation

UNIX ASCII terminal



MS-DOS Computer



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ASK THE VENDOR

I currently use the Unipress Emacs, a writing and programming editor, for Unix computing and image processing. I work primarily on SunOS Version 4.0 and Interactive IX/386 Unix Release 4, but I feel somewhat limited because Emacs does not support all the features available in X Window. Will there be any useful enhancements soon?

Ron Natalie
Senior vice-president
KTS, Inc.
Sterling, Va.

UNIPRESS SOFTWARE: X Window support has recently been enhanced in Version 2.2 of the Emacs Programming and Technical Writing Editor. The product now includes multiple X Windows with icons, mouse control, scroll bars and pop-up menus. Capabilities currently under development are hypercard-style buttons, tear-off menus and live icons (e.g., trash cans).

Bringing point-and-click functionality to Unix users

X.Desktop, Looking Glass differ in following Unix procedures

BY DALE DOUGHERTY

Two products — IXI Ltd.'s X.Desktop Version 2 and Visix Software, Inc.'s Looking Glass — are competing to emerge as the standard "Finder," the home base from which all Unix applications are launched.

Both promise to help make Unix workstations as accessible to users as Apple Computer, Inc.'s Macintosh. Both offer visual interface shells, equivalent to the Mac's Finder, that use a desktop metaphor to organize the file system and allow users to interact in a window that displays icons representing files and applications. Instead of typing a command to open an application, users can move a mouse pointer to select the icon and click a mouse button to initiate actions.

X.Desktop and Looking Glass are garnering a lot of interest in the Unix community because they are among the first applications to run under X Window System and implement the OSF/Motif graphical user interface.

X Window has been embraced by vendors as the vehicle for delivering easy-to-use graphics applications on Unix workstations. Developed at MIT, X Window defines the underlying network protocol but avoids defining a graphical user interface. That is, it does not specify the look and feel of applications running under X Window. That has been left for the open market to decide, and the choice seems to be between Motif from the IBM-backed Open Software Foundation and Open Look from Sun Microsystems, Inc. and AT&T. A graphical user interface defines a visual style and a common set of techniques that all applications can employ to interact with users.

> X.DESKTOP works the way you'd expect a Unix/X application to work. . . . Visix Software built its own X tool kit to meet its own [performance and functionality] requirements.

The main appeal of a graphical interface is that it is intuitively understood; users feel comfortable and become productive more quickly. If Unix is to become a serious platform for business applications, learning Unix needs to be a non-issue. For that reason, these products are likely to be judged not only by standards in the Unix community but by how close they come to the Mac "standard."

When you log on to X.Desktop, you get a single window with several folder icons, one of which represents the user's home directory. If you open a folder, you may see other folder icons along with file icons that are application-specific. Another icon is a temporary directory, similar to the Macintosh's wastebasket, where users can drag files to remove them from the system.

You can drag any file or application icon from its folder and place it on the desktop. In that way, you can place commonly used applications and files where you can easily find them from one session to the next. You can open any application by double-clicking on its icon.

PRODUCT FACE-OFF

X.Desktop also implements drop actions; that is, if there is a printer icon, you can drop a file icon on top of it to print a file. Unlike the Macintosh, X.Desktop uses pop-up menus, which are displayed when you press down a mouse button inside a window. Only one pop-up menu is provided by default. X.Desktop Version 2 is much improved visually over previous releases, sporting higher definition cursors and icons.

Through the Looking Glass

In Looking Glass, you see a system window, one or more directory windows and a desktop window. From the system window, you can open any directory. A directory window is split into two areas: subdirectories are shown as folders in the top part, and files are shown in the bottom half. Like X.Desktop, double-clicking on a file opens the application that created the file.

The desktop window is a panel in which you keep commonly used applications or files. (The Next, Inc. machine applies the same concept.) The desktop panel is a convenient place to store applications so that you can launch them without navigating through the directory structure.

All Looking Glass windows contain a menu bar. Macintosh-style pull-down menus organize a number of common tasks and make them easy to identify and initiate. For instance, you can set preferences, such as the desktop colors, by making a menu selection. X.Desktop preferences are not set from inside the program but by editing initialization scripts. That is very much the Unix/X way to do it, but it is more difficult on the user.

The Looking Glass desktop is crisp, sophisticated and well organized, largely because many user actions can be accessed from pull-down menus. It includes subtle features found in the Macintosh Finder, such as dragging to select the icons within a region. It does not, however, support dropping an icon on another icon as a way of initiating actions, as does X.Desktop. Drop actions offer a potentially easy way for Unix users to communicate with devices.

Flexible rules and customization

X.Desktop and Looking Glass both had one major problem to solve — how to implement the desktop on an operating system that was not designed for a point-and-click interface.

For example, the Unix operating system does not distinguish among different types of files. Both X.Desktop and Looking Glass employ a file typing mechanism that establishes rules to determine file type and, by extension, what icon to assign a file and what action to take when that file or application is opened. Sets of rules are provided, but both products also allow users to write their own rules or change the existing ones. Multiple rules and actions can be specified. For instance, the default action for a text file may be to open it for editing; however, a secondary action could be specified that prints the file.

This method of invoking applications is a feature that can be used to great advantage by administrators and developers in making it much easier for users to access applications. The only possible problem with this is that longtime Unix users will find it difficult to specify Unix command-line options that vary from time to time.

No single product can cover every situation in determining how much of the Unix system users need to access or even what should appear on the desktop. Thus, both products are highly configurable. A systems administrator, analyst or applications developer is expected to customize the product for the end users' needs.

This is important, because one should not consider X.Desktop or Looking Glass as "canned" user interfaces. In fact, this is one area in which they exceed the capabilities of the Macintosh Finder by allowing customization of nearly every detail.

Because X.Desktop and Looking Glass implement the same interface, they look very similar. They are, however, very different implementations.

X.Desktop works the way you'd expect a Unix/X application to work. It is implemented using the OSF/Motif tool kit, and under the surface it is doing very standard Unix things. When it displays information about files, you can depend that the information is being accessed in the usual way from the Unix file system. Doing things the standard way is comforting to those in search of standards, but there can be some performance penalties.

Different strokes

If Visix Software didn't do it the standard way, it is because it believes it did it a better way. The firm built its own X tool kit to meet its own performance and functionality requirements. It also bypassed some Unix facilities for the same reason. One example is the File System Server (FSS), a systemwide database that compiles information about file types and their associated rules. When the user lists the contents of a directory, Looking Glass gets this information from the FSS; it does not access the Unix file system.

Nor does Looking Glass create a process to get this information; it handles the request internally. Looking Glass runs as two processes — the File System Server and the Looking Glass process — which can achieve an overall performance gain.

X.Desktop and Looking Glass are available for a variety of Unix platforms, both through OEMs and in shrink-wrapped versions that start at $495. •

Dougherty is an editor and writer at O'Reilly & Associates, a Cambridge, Mass.-based technical publishing company specializing in Unix and X Window System.

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Surge expected in real-time sector

BY ELLIOT KASS

For the first time in its existence, real-time Unix is starting to attract some big-time attention.

Although real-time Unix systems have been available since about 1982, they never made much of a dent in the market. Developed for multitasking applications, the operating system was not well-adapted to the task prioritization needed to guarantee response time. On the whole, processing time was substantially slower for real-time Unix than for the dedicated proprietary systems that claimed about 90% of the market.

Through the mid-'80s, real-time Unix was the domain of a half-dozen or so smaller specialty houses that concentrated on the real-time environment. Only in the last couple of years have the bigger vendors become interested in the market.

During that time, the number of companies providing Unix with some degree of real-time functionality has more than doubled. There are now about 15 providers in the market, including such major players as IBM, AT&T, Digital Equipment Corp. and Hewlett-Packard Co. Most of the other major system suppliers have expressed interest in the area.

What is piquing all this new interest? A number of things.

First of all, users are discovering that, for all its well-known faults, Unix can offer tremendous advantages over proprietary systems in a multiprocessing environment.

Applications written on Unix are portable. Unix is supported by reduced instruction set computing (RISC) and other advanced platforms and provides far more functionality than most other real-time operating system kernels. Programmers are generally familiar with the system, and it is relatively easy to write applications on Unix — all the more important because real-time applications are comparatively difficult to develop and debug.

Response times improve

Another contributing factor is that some of the smaller firms that have specialized in Unix-based real-time systems have substantially upgraded the quality of their products, particularly over the past year, boosting response time to a level that approaches the speed of simpler, dedicated systems.

These improvements have induced some users, such as Moses Joseph, manager of computer applications at Pepsico Research and Technical Services, the research and development arm of Pepsico, Inc., to begin implementing real-time Unix.

Pepsico is experimenting with real-time Unix applications in a pilot plant with the goal of simplifying plantwide automation by breaking the undertaking down into smaller, more manageable equipment modules. The process-control applications at the heart of each module run under real time. Unix's multiprocessing environment ties them all together, enabling the activities of each module to run simultaneously.

In the long run, however, it is not just interest in multiprocessing or the partial conversion of users like Joseph that is causing the larger vendors to circle. At the heart of the matter is a dawning belief that the potential for real-time Unix extends far beyond the need for real time itself.

"In the early '80s, users bought real-time Unix because it was the only generic real-time system," says Wendy Rauch-Hindin, president of Emerging Technologies Group, Inc., a Long Island-based technology and market research organization. In the future, however, a whole new group of buyers will invest in real-time Unix because of the portability it will offer.

According to Rauch-Hindin, once an industry-wide standard for real-time Unix systems becomes available — in the form of IEEE P1003.4 Portable Operating System for Unix (Posix), real-time Unix will break out of its confinement in special-purpose niches such as manufacturing and process control to become part of a new standard Unix.

"Users without real-time requirements will use the same system, but without the real-time extensions, which will be licensed separately," says Rauch-Hindin.

The catch is that none of this can happen without a finalized Posix standard and, although Posix is tantalizingly close to completion, the approval process still stretches ahead. Posix developers estimate that full approval is nine to 12 months off, while Rauch-Hindin postulates it will occur in 1992 or 1993. Some vendors are already pressing ahead with products specifically geared toward Posix, convinced that user demand will justify the investment. However, most are biding their time and watching for signs of true commitment on the part of users.

"They won't start pushing them for the next few years," according to Rauch-Hindin, because that would mean undercutting their own proprietary systems "for something that isn't debugged, standard or widely accepted." While the big vendors hang back, waiting for a broader market to gel, smaller companies will scoot in and snap up customers anxious to get started with a nonproprietary real-time system.

STELLA JOHNSON

Pepsico's Joseph *sees untapped uses*

Joseph is one purchaser who would rather buy from a small provider now than spend the next few years waiting for the crowd to catch up. "Do you know how long it takes for them to get these standards really nailed down?" he asks. "I am willing to go ahead now before the standards are hammered out completely. That's how you grab a competitive edge."

In spite of his willingness to jump out ahead of the standards process, Joseph is not willing to bypass them entirely. He chose to work with Lynx, a small privately held start-up based in Campbell, Calif., and its Unix-based LynxOS operating system for Pepsico's pilot project because, he says, the vendor is carefully tracking Posix's development, and "when the standard does come out, it will most likely be compatible."

That is more certainty than many of the larger vendors could offer, according to Joseph. "The major vendors are playing a watch-and-wait game. They want to know if we're serious about this," he says. His reply? "We haven't gone out and sold the ranch on real-time Unix. It's a commitment, but it's not a sweeping commitment."

It was not only Posix compatibility that was at issue, Joseph adds. Lynx's experience in real-time applications and the sophistication of their product outweighed that of their larger competitors.

The issue of expertise vs. marketing muscle is a crucial one to the smaller systems houses concentrating on the real-time environment. "The next two to three years represent an important window of opportunity," concedes Ash Brahma, Cambridge, Mass.-based Venturcom, Inc.'s director of marketing.

This is the time frame available to smaller vendors to demonstrate to users unwilling to wait that they have the ability to meet their requirements. By 1992, the market for real-time Unix will have become much more crowded.

Brahma's estimate of the schedule for market development corresponds with Joseph's observations.

Most of the current demand for real-time Unix "is really quite specialized," Joseph says. "The bulk of the demand won't come for another two to four years down the line. A lot of people have applications for it and don't even realize it. Most people are waiting and watching rather than doing anything." •

Kass is a free-lance writer based in Jacksonville, Fla.

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When do you think we will be able to incorporate artificial intelligence technology into our conventional computing processes, particularly advanced speech technology?

Doug Plumsteel
President
Consumer-Response Marketing Ltd.
Vancouver, B.C.

TEXAS INSTRUMENTS: We released multiuser speech products in April 1989. These product announcements included a development tool kit and a verification development package. Runtime packages of each are currently available.

You will notice an increasing emphasis on software tools from TI. We are currently working on development of several AI technologies for our conventional computing systems, and those should hit the market in late 1990.

Many of these packages are in development at this time, with beta testing in selected markets initially.

ASK THE VENDOR

How do real-time Unix operating systems, such as LynxOS, compare with proprietary systems in terms of performance and compatibility with shrink-wrapped software?

Tom Forgette
Software engineer
Computer Applications Software Technology
Los Alamitos, Calif.

LYNX REAL-TIME SYSTEMS: LynxOS was designed to give real-time capabilities to 32-bit microcomputers based on the Motorola 68000 processor family, and other processors including the 80386, RISC and Sparc.

LynxOS is based on a real-time multitasking, multiuser kernel. Proprietary real-time systems are very fast but can't run standard Unix software. LynxOS combines speed comparable to the proprietary systems with the portability and compatibility of standard Unix. LynxOS runs shrink-wrapped packages such as Informix, Wordperfect, QCalc and Fortran, Pascal and Basic compilers.

LynxOS gives users X Window support and compatibility with standards such as University of California at Berkeley Unix 4.2, Posix and System V Interface Definition. Unlike standard Unix, however, LynxOS allows users to prioritize and preempt tasks, which real time requires.

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* The Wall Street Journal (1987) — "Survey of the Information Processing Marketplace."
* The Adams Co. (1988) — "Information Systems Management Study."

COMPUTERWORLD

Databases for the Unix environment

VENDOR	PRODUCT	UNIX VERSION SUPPORTED	LANGUAGE	DISK SPACE (megabytes)	QUERY LANGUAGE SUPPORTED	VERSION OF SQL	IMPORT/EXPORT FILE FORMATS	TABLES PER DATABASE	ACCESS METHODS	LOCKING LEVEL	RECOVERY CAPABILITIES	OTHER ADMINISTRATOR UTILITIES	APPLICATION DEVELOPMENT TOOLS	DATA COMPACTION	CLIENT/SERVER ARCHITECTURE	WINDOWING FACILITIES	NETWORKS SUPPORTED	PRICE
Amperif Corp. (818) 998-7666	RDM/2 with Noah Relational Database Software	System V	C	1.4 (software), 2G (RDM/2)	SQL	Level 1	WKS	32,000	NP	Page, table	Roll forward, transaction analysis and logging	Noah/SQL data definition, authorization commands, dump and load	Intelligent editor, precompiler, report writer, runtime library	Yes	Yes	Proprietary	Decnet, Ethernet	$196,000-$507,700
Automated Systems (605) 335-3636	Easy-Base II	System V Release 3.2, interactive	DBL	1	None	None	ASCII, Lotus	5	Direct, index, ISAM, sequential	Record	None	System security	None	No	No	None	None	$1,195
Binary Research, Inc. (215) 233-3200	Apogee 5.0	System V, AIX, Xenix	C	512K	SQL	ANSI standard	ASCII, Dbase III, Import-WKS, SDF	256	B tree index, random, sequential	Byte, record	Data recovery, roll backward and forward, transaction logging	Menus	C Translator, language command help, optimizer with runtime lockup, program editor, report andscreen generators, syntax checker	No	No	Proprietary	Bantam, Netware, Novell, TCP/IP	$249
BRS Software Products (703) 442-3870	BRS/Search	System V, Berkeley 4.3, SunOS 3.2, Xenix, NBI Duplex 4.2	C	7-10	Proprietary	None	ASCII flat files	NA	Direct	Record	OFF continue of logged session, system backup commands, user tracing	Ability to build and maintain system features and user profiles	Menu-driven interface creator, print and display formatters	Yes	No	None	Ethernet, Novell	$2,000-$180,000
Computer Associates International, Inc. (800) 645-3003	CA-DB/Unix	System V, Berkeley 4.0, AIX, Ultrix	C	2	SQL	ANSI standard	NP	Unlimited	Direct, index, sequential	Page	Archive during update, roll backward and forward, transaction logging	Cross-reference, I/O and lock monitors	3GL application generator	No	Yes	Proprietary	Decnet, TCP/IP	$4,000 - $300,000
Conceptual Software, Inc. (800) 782-8969	Prodas	SCO Xenix 3B2	C	2	Prodas	None	DIF, SAS, WKS, Dbase	Unlimited	Direct, index	None	None	None	High-level programming language	No	No	Proprietary	10-Net, Novell	$995
Concurrent Computer Corp. (800) 631-2154	Ingres for RTU	System V Release 3	C	25	QUEL, SQL	ANSI standard	DIF	Unlimited	B tree, hash, heap, ISAM	Page	Roll backward and forward, transaction logging, backup, data recovery	Add, change length and convert columns, journaling/ recovery, index removal	3GL and 4GL query languages, 4GL tools	Yes	Yes	X Windows	Ethernet, TCP/IP	$3,835-$213,000
Data Access Corp. (305) 238-0012	Dataflex	System V	C	2	Proprietary	None	ASCII, Dbase	255	Index, sequential	None	None	DFfile, DFindex, dictionary, file maintenance	None	No	No	None	Any on which operating system provides transparent access	$1,250
Desktop AI, Inc. (203) 255-5600	DBX/DB port	System V, SunOS, Xenix	C	900K	Standard Dbase	ANSI standard	ASCII, DIF	64	Direct, index	File, record	Available with the use of alternate file system	Load and unload utilites	Application generators, templates	Yes	Yes	Any Dbase-compatible facilities	Any supporting C	$600
Empress Software, Inc. (301) 220-1919	Empress RDBMS	System V, Ultrix, Xenix, AIX, Dynix	C	8	SQL	ANSI standard	ASCII	9,999	B tree, index, direct	Page, record	Roll backward, transaction logging	Archive, batch, load, recovery, warm restart	Empress 4GL, report writer	No	Yes	Apollo Display Manager, Sunview, X Windows	Apollo, Decnet, NFS, RFS, Vaxcluster	$1,250-$100,000
Gupta Technologies, Inc. (415) 321-9500	SQL Base	SunOS 4.0.3	C	1	SQL	ANSI standard	ASCII, CDF, DB2, DBF, DIF	Unlimited	B tree, direct, hash, index	Page	On-line backup, roll backward and forward, transaction logging	Wintalk graphical user interface	SQL Talk, SQL Windows	Yes	Yes	Motif, Presentation Manager, Open Look, Windows	Netbios, TCP/IP	$1,300-$3,000
Hewlett-Packard Co. (800) 752-0900	HP Allbase/ SQL	HP UX	Pascal	8	SQL	ANSI standard	No	Unlimited	B tree, index, sequential	Page, table	Roll backward and forward, transaction logging	Integrity verification, migration backup and restore	3GL and 4GL preprocessors for C, Cobol, Pascal, Fortran, Query, Info Access	Yes	Yes	X-11 Windows	ARPA/ Berkeley, Ethernet, NS, X.25	$3,400-$36,750
Information Builders, Inc. (212) 736-4433	Focus for Unix	System V	C	4-5	Focus Table, SQL-to-Table translator	ANSI standard	Focus, ASCII word processing format	64	Index, sequential	None	None	Password protection	Language editor, host language interface, schema creation, code generation, data maintenance and reporting, window and screen painters	No	Yes	None	Ethernet using TCP/IP	$1,000-$74,500
Informix Software, Inc. (415) 926-6300	Informix-Turbo	All shared memory versions	Assembler, C	875K	SQL	ANSI standard	ASCII flat file	Unlimited	B tree, index, hash, link, sequential	Page, record, row	Roll backward and forward, transaction logging	Archiving, turbo system status monitoring	Informix-4GL, SQL, ESQL	Yes	Yes	None	Decnet, Starlan, TCP/IP	$1,095-$79,300
Infosystems Technology, Inc. (301) 345-7800	Secure Ruix	System V, Berkeley, Xenix	C	4	SQL, proprietary	ANSI standard	ASCII, SYLK, DIF	Unlimited	B tree, index	Record	Roll backward and forward, transaction logging	Orange Book security, performance monitoring, transaction auditing	Forms-based interface	Yes	Yes	Proprietary	TCP/IP	$995-$76,000
Interactive Technology, Inc. (800) 362-6203	RDM Version 4.2E	System V, Xenix Versions 2.4 and 3.0	Pascal	3.5	None	None	ASCII, Direct from other RDM supported environments	Unlimited	Direct, index, keyed search, link	Record	None	Data recovery, file maintenance, merge, purge, sort, system security	4GL DML, data entry, forms, menu system, report writer	No	No	None	3Com, Banyan, Novell	$1,495

The companies included in this chart responded to a recent telephone survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

PRODUCT SPOTLIGHT

VENDOR	PRODUCT	UNIX VERSION SUPPORTED	LANGUAGE	DISK SPACE (megabytes)	QUERY LANGUAGE SUPPORTED	VERSION OF SQL	IMPORT/EXPORT FILE FORMATS	TABLES PER DATABASE	ACCESS METHODS	LOCKING LEVEL	RECOVERY CAPABILITIES	OTHER ADMINISTRATOR UTILITIES	APPLICATION DEVELOPMENT TOOLS	DATA COMPACTION	CLIENT/SERVER ARCHITECTURE	WINDOWING FACILITIES	NETWORKS SUPPORTED	PRICE
Interbase Software Corp. (800) 245-7367	Interbase	System V, Berkeley 4.2, SunOS Version 4.0, HP UX, Aegis, Ultrix	C	5	SQL, GDML	ANSI standard	NP	64,000	Direct, index, nonindex, triggers	Record	After-image journaling restore utility, instant recovery using multi-generational record structures, on-line backup	Automatic tuning facility, database verifiers, data definition, verification and database sweeping	Interactive SQL and GDML, preprocessor for SQL and GDML in ADA, Basic, C, Cobol, Fortran, Pascal, PC/I	Yes	Yes	DEC Windows, Apollo display manager, News, Sunview, VAX/UIS, X Windows	Decnet, Apollo Domain, TCP/IP	$5,000-$75,000
Jaybe Software (602) 327-2299	C DBMS Toolkit	System III and V Version 7, Berkeley 4.2 and 4.3	C	Less than 4	Unix AWK	None	None	Unlimited	Direct, dynamic link, index, join	Record	Roll forward, transaction logging	File protection, index tool, integrity checker, passwords	Database editors, printout and menu tools, selection	No	No	NP	NFS	$695
Mantech Software Solutions Corp. (703) 960-8800	Seed DBMS	System V Release 3	C, Fortran	8-10	Proprie-tary	None	None	NA	B tree, direct, set	Page, record	Roll backward and forward, transaction logging	File maintenance, forms control, initialization	None	No	No	None	None	$8,000-$100,000
MDBS, Inc. (800) 323-3629	MDBS IV	Interactive, SCO	C	5	Know-ledge-Man, SQL	ANSI standard	ASCII	255	Direct, index, link	Page, record	Abortable transactions, fault tolerance, roll backward and forward, transaction logging	Internal physical consistency, monitoring of space utilization and access privileges, selective repair	None	Yes	Yes	None	Netbios, SPX	$3,900
Officesmiths, Inc. (613) 235-6749	The Officesmith	System V Release 3, Berkeley 4.2, 386/IX, AIX, Dynix 3.0, SCO Unix, Ultrix	C	4 (software), 3 (initial database en-vironment)	Proprie-tary	None	SGML (ISO 8879 standard)	NA	B tree, index	Field, file, record	Automatic and incremental backup and recovery from hardware or software crash, field Undo, recovery, transaction logging	Group security, printer and terminal configuration, transfer document ownership	Tools to develop new document types, screen and print formats	No	No	Proprietary	None	$7,500-$64,000
Ontologic, Inc. (617) 272-7110	Ontos	Domain IX SR10.X, SunOS 4.0	C, C++	10	Object SQL	ANSI standard	None	Unlimited	B tree, hash, table	Object, record	Roll backward, transaction logging	Network file/database location	C++ compiler, database browser	No	Yes	Sun	OS/2 LAN Manager, TCP/IP	$15,000-$150,000
Oracle Corp. (415) 345-3267	Oracle	System V Release 2 or higher, Berkeley 4.2 or higher	C	6	SQL	ANSI standard	DIF, SYLK, WKS	Unlimited	B tree, index, physical cluster	Row	Full and partial database, roll backward and forward, transaction logging	DBA, SQL	SQL forms, menu, report writer, precompilers	Yes	Yes	DEC Windows, Sunview, X Windows	Asynch, SNA, Decnet, LU6.2, SPX/IPX, TCP/IP, TLI	$3,400-$231,000
Plexus Software, Inc. (408) 980-8190	Plexus XDP Datamanager	System V, SunOS, HP UX	C	NP	SQL	ANSI standard	NP	2 billion	B tree, sequential	Page, row	Full, incremental and on-line backup; roll backward and forward; trans-action logging	DB import/export, ISQL, tb mode, monitor, stat and type	4GL, user interface builder	NP	Yes	MS Windows	TCP/IP	$5,000 - $250,000
P-Stat, Inc. (609) 924-9100	P-RADE	System V Release 3, Berkeley 4.3	C, Fortran	5	P-STAT	None	ASCII, Dbase, DIF	1	Direct	None	Transaction logging	Status reports defining new indices	P-STAT system language	Yes	No	None	Ethernet	$500-$8,000
Progress Software Corp. (617) 275-4500	Progress	System V Releases 2 and 3, Berkeley 4.2, Ultrix 3.0 or higher, AIX, Xenix Version 2.1 or higher	C	640K	Proprie-tary	ANSI standard	1-2-3, ASCII, Dbase, DIF, SYLK	1,024	B tree, index, direct	Record	Roll backward and forward	User and resource monitor, index analysis and rebuilding	Progress 4GL, Fast Track application builder	No	Yes	None	Decnet, Netbios, Openet, SPX/IPX, TCP/IP	$1,050-$190,000
QNE International (215) 968-5966	Apogee	System V Release 3, Xenix	C	2	SQL	ANSI standard	ASCII, WKS	Unlimited	ISAM, direct, sequential	Page, record	Roll backward, transaction logging	Data encryption	4GL	No	No	Any	NP	$1,500-$10,500
Raima Corp. (206) 747-5570	DB-Vista III	System V, Berkeley 4.2, Ultrix	C	2	SQL	None	ASCII	4 billion	Direct, index, link	Record	Transaction logging	Data dump, interactive database access, lock manager, print utility	Access and definition language	No	No	None	Yes	NP
Recital Corp. (508) 750-1066	Recital	System V Version 3.2	C	2	Dbase, Recital, SQL	ANSI standard	Fixed format DBF	Unlimited	B tree, direct, index, sequential	Page, record, row	Journaling, roll backward, recover	None	4GL, Application data dictionary, report writer, screen formatter and painter	No	No	None	Decnet, NFS	$995
Relational Technology, Inc. (800) 446-4737	Ingres RDBMS	System V Version 5.2 or higher, Berkeley 4.2 or higher	C	40	SQL, QUEL	ANSI standard	ASCII, DIF, SYLK, WKS	Unlimited	B tree, index, ISAM, hash, heap	Page	Roll backward and forward, transaction logging, backup and restore	Database application porting utilities security, performance tuning	Ingres forms system, 4GL, ESQL/C, Fortran, Cobol, Basic, PL1	Yes	Yes	Open Look, Next Step, OSF/Motif, Sunview, X Windows	Decnet, LU6.2, SNA, TCP/IP	$2,000-$197,500
Rim Technology (206) 392-4776	RTI Rim	System V, Berkeley	Fortran	700K	Proprie-tary	None	ASCII	Unlimited	B tree, index, sequential	Page	None	Backup, recovery, user access	Application program interface	No	Yes	None	Domain NFS, Token-Ring	$2,400-$8,800
Robinson Schaffer Wright, Inc. (408) 429-6229	RDB	System V, Berkeley, Xenix, UTS, Unicos	Bourne shell, C	1-2	Proprie-tary	None	Mac, Unix formats	Unlimited	B tree, binary, direct, hash, ISAM, link, record, shell	Byte, record, table, user	Roll backward and forward, transaction logging	Unix utilities by row, table, user	Standard Unix tools, C subroutine library	Yes	Yes	X-term	Banyan, Ethernet, Novell, Starlan	NP
The Santa Cruz Operation, Inc. (408) 425-7222	SCO Foxbase+	SCO Unix System V/386, SCO Xenix System V	C	670K	NP	None	ASCII	Unlimited	Index, link	Record	None	None	Dbase-compatible language	No	No	None	SCO Xenix Net	$395-$995
	SCO Integra	SCO Unix System V/386 and Xenix System V	C	5	SQL	ANSI standard	ASCII, DBF, WKS	Unlimited	X/Open compatible SCO ISAM	Data-base, record, table	Roll forward, transaction journaling	On-line help, journal option	Application development library	No	No	NP	SCO Xenix Net	$895
Saturn Systems, Inc. (612) 944-2452	Saturn Base Plus	System V/286 and 386, SCO Xenix 2.4 and 3.0	Pascal	4	Proprie-tary	None	Most file formats	Unlimited	Direct, index, sequential	Record	User-definable	Specific recoverey	Context-sensitive help, forms, menus, reports, security, utilities, high-level procedural language	No	No	Proprietary	Banyan Vines, Novell Netware, 3Com, 3+Share	$1,495
Sauer Computer Systems (800) 234-2100	Key/500	System V	C	5	QBE	None	ASCII standard	Unlimited	Index	Record	Logging	Define schema	Report and screen generator	No	Yes	Proprietary	None	$350-$3,450

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SUN

No commercial-grade file system

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No symmetric multiprocessing

DEC

No open I/O bus across product line

No symmetric multiprocessing currently available

No multi-vendor binary compatibility

No system under $700/MIPS

IBM

No open architecture

No multi-vendor binary compatibility

No POSIX compliance

No system under $2500/MIPS

No symmetric multiprocessing

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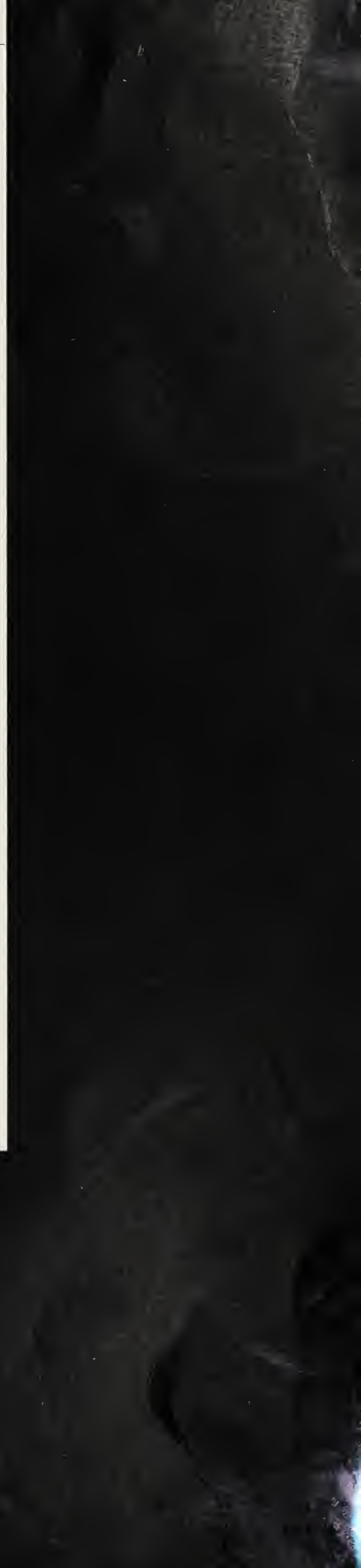
PRODUCT SPOTLIGHT

VENDOR	PRODUCT	UNIX VERSION SUPPORTED	LANGUAGE	DISK SPACE (megabytes)	QUERY LANGUAGE SUPPORTED	VERSION OF SQL	IMPORT/EXPORT FILE FORMATS	TABLES PER DATABASE	ACCESS METHODS	LOCKING LEVEL	RECOVERY CAPABILITIES	OTHER ADMINISTRATOR UTILITIES	APPLICATION DEVELOPMENT TOOLS	DATA COMPACTION	CLIENT/SERVER ARCHITECTURE	WINDOWING FACILITIES	NETWORKS SUPPORTED	PRICE
Sharebase Corp. (408) 378-7000	Server/300	System V, Berkeley, DEC Ultrix, SunOS, HP UX, Pyramid OSX, Xenix, Aegis/ Domain	C	NA	Quel, SQL	ANSI standard	Dbase, Lotus, PFS, Wordstar	32,000	B tree	Page	Database transaction dump and load, roll forward	Formatted data copy in and out, set system time	Freeform, JAM, Natural language 3GL precompilers; Cobol, Fortran, C runtime libraries	Yes	Yes	MS Windows	3Com, Decnet, RS-232C, XNS	$45,000-$136,000
	Server/700	Same as above	C	NA	Quel, SQL	ANSI standard	Same as aboved	32,000	B tree	Page	Same as above	Disk mirroring, formatted data copy in and out, set system time	Same as above	Yes	Yes	MS Windows	3Com, Decnet, IBM Black Mux, RS-232C, XNS	$195,000-$280,000
	Server/8000	Same as above	C	NA	Quel, SQL	ANSI standard	Same as above	2 billion	B tree	Page	Same as above	Same as above	Same as above	Yes	Yes	MS Windows	NP	$363,000-$548,000
Sir (USA), Inc. (312) 480-9270	Sir/DBMS	System V Release 4.2, Aegis, HP 9000, HP UX, SunOS, Ultrix	Sirtran	6-10	SQL, PQL	ANSI standard	Dbase, DIF	32,000	Balanced B tree	Row	Journaling, roll forward, full unload/reload	Disk space usage, disk block caching, CPU and memory utilization	Procedural 4GL language, PQL	Yes	Yes	Proprietary	Apollo, Decnet, Novell, Sun	$5,000-$100,000
The Small Computer Co. (914) 769-3160	FilePro Plus	System V	C	2	SQL	None	DIF, SYLK, WKS	Unlimited	Direct, index	Record	None	FP Copy (copy, rename)	Field editor, menus, passwords, report generator	No	No	None	3Com, Netbios, Novell, PC-Net	$990-$3,990
Specialized Systems Consultants, Inc. (206) 527-3385	Zebu Records Management System	System V, Berkeley, Xenix	C	50K	AWK, sort Unix utilities	None	ASCII	NA	Index	None	Utilities to rebuild index	None	Screen description language	No	No	None	None	$150
Sterling Software, Zanthe Systems Division (613) 727-1397	Zim	System V Release 3	C	512K, plus 256K per user	Proprie-tary	ANSI standard	ASCII, CDF, DB2, DIF, SQL/DS	9,999	B tree	Page	Recovery	None	Application and menu generator, ad hoc query and report specifier, on-line help, security module	No	Yes	Proprietary	DOS-Net, MS-Net, Novell, QNX	$930+
Sybase, Inc. (800) 447-9227	Sybase	System V Release 3, Berkeley 4.3	C	6	SQL	ANSI standard	ASCII, binary	2 billion	Clustered index, wholex	Page	Disk mirroring, on-line backup and maintenance, roll backward and forward, transaction logging	Bulk loading and copying	4GL, application generator, forms and menu editor	No	Yes	DEC, Sunview, UIS	Decnet, TCP/IP	$2,495-$200,000
Tekton Software, Inc. (303) 444-0451	Aspen/2 Data Manager	System V	C	300K	Proprie-tary	None	ASCII	Unlimited	Direct	File	Roll backward	None	Screen generator, report formatter	Yes	No	None	IBM, Novell, Token-Ring	$595+
Teradata Corp. (213) 827-8777	DBC/1012	System V Release 2 or higher, Berkeley 4.2 or higher	C	NP	DBC/ SQL	ANSI standard	DIF, Flat file	32,000	Index, nonindex	Data-base, row, table	Roll backward and forward, transaction logging	Fast load, lock monitor, resource utilization statistics	BTEQ, C preprocessor, library of Call Level Interface routines	Yes	Yes	NP	TCP/IP Ethernet	$500,000
Thoroughbred Division, Concept Omega Corp. (201) 560-1377	Thoroughbred Idol-IV	System V, Berkeley, Xenix V	Tho-rough-bred Business Basic	20	Tho-rough-bred Query IV	ANSI standard	Proprietary	Unlimited	Direct	Page, record, row	Full backup, restore	Audit file, edit, print, list definition libraries, security, operation codes, error log, terminal configuration	Script IV (4GL development language)	No	Yes	Proprietary	Novell, RFS, Xenix Net	$495-$4,695
Tominy, Inc. (513) 984-6605	Mach 1	System V (current AT&T, Motorola, NCR and SCO versions)	C	4	SQL	ANSI standard	DIF	Unlimited	Direct, index, link, random	Record	None	Chain analyzer, database statistics, file expander, synonym analyzer, system file member request	4GL, print and screen handlers, program generator	No	No	None	Novell	$1,750 - $30,000
Tom Software, Inc. (206) 246-7022	Speed I	System V, Xenix	Basic, 2C	2	None	None	ASCII	Unlimited	Block, direct, hash, index, ISAM, physical, relative, sequential	Com-pany, file, record, system	Integrated file backup system	Automatic file restructuring, diagnostic performance, repair and maintenance, dictionary and security editors	4GL, Basic	Yes	Yes	None	IBM, Novell, Sperry, usernet	$1,000-$20,000
Unify Corp. (916) 920-9092	Accell/SQL for Unify 2000	System V, Berkeley, AIX, Ultrix, Xenix, A/UX	C	35	SQL, 4GL (Accell)	ANSI standard	DIF, proprietary	2.3 billion	B tree, direct, hash, link, sequential	Row	Roll backward and forward, on-line backup	B tree, hash statistics, user locks	4GL, embedded SQL, forms generator	No	No	Accell, MS Windows, Open Look	TCP/IP	$4,500 - $120,000
Uniplex, Inc. (800) 356-8063	Uniplex II Plus	AIX, System V, Xenix V, Ultrix	C	20	Uniplex SQL	ANSI standard	ASCII, DIF	Unlimited	C-ISAM	Column, data-base, record, row, table	Commit, roll backward and forward, transaction logging, backup and recovery	Database integrity, grant privileges	Screen builder, report writer	Yes	Yes	X Windows	NFS	$1,095-$89,995
Versasoft Corp. (408) 723-9044	DBMAN V Series	System V, AIX, Xenix, SunOS, SX/AR, UTS	C	1.5	Dbase	None	Delimited ASCII, DIF, SDF	Unlimited	Direct, index	Page, record, row	Transaction logging	Copy and delete files, list directories, list file usage, query system configuration	Application generator, debugger, editor, report writer	Yes	No	Proprietary	Any	$595-$24,995
VMark Software, Inc. (508) 655-3700	Universe	System V Release 3, Berkeley, AIX	C	20	None	None	CPTO, TAR	NP	Direct	Record	NP	NP	Basic programming language	Yes	No	Sunview, X Windows	Ethernet, TCP/IP	$330
XDB Systems, Inc. (301) 779-6030	XBD-SQL, XBD-Forms	System V Release 3	C	4	SQL	ANSI standard	ASCII, DBF, DBMAUI, DIF, SYLK, WKS	Unlimited	Direct, index	Record	Roll backward and forward, transaction logging	Data dictionary, SQL, system monitor, usage statistics	Menu and forms generator, procedural report writer, programmatic interfaces	No	Yes	X Windows	TCP/IP	$2,495
ZFOUR, Inc. (305) 591-2274	ZFOUR QL/1	AIX, Berkeley, SunOS, Ultrix, Xenix	C, QL/1	7M	QL/1, SQL	ANSI standard	ASCII, DIF	Unlimited	B tree index	Record	Roll forward, transaction logging	Comprehensive security	4GL documenta-tion, menu, program, report and screen generator	Yes	No	None	Banyan, NFS, Novell, Token-Ring	$1,000-$150,000

This is the biggest computer announcement Digital has ever made.



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Introducing the VAX™ 9000 series. It's a mainframe. It's a supercomputer. And best of all, it's a VAX computer.

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'Hello, Europe, are you there?'

Fragmented national telecom could slow Euro-American net connections

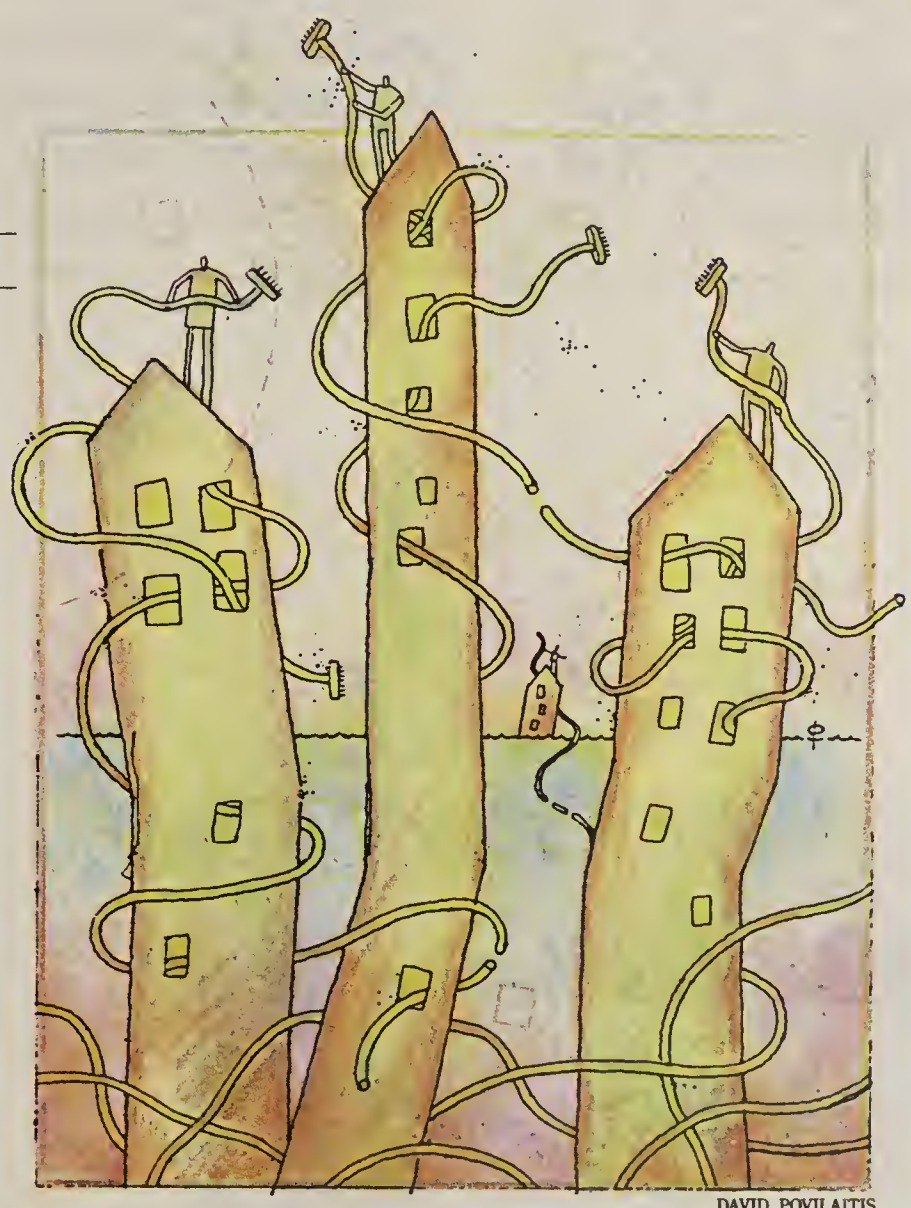
Continental divide

BY RAYMOND BOULT

European telecommunications infrastructures are unlikely to be either unified or deregulated in time to support the many U.S. Fortune 1,000 companies that intend to set up on "The Continent" for the much-vaunted economic unification of 1992.

This does not mean that U.S. companies should reschedule their plans, however, or redesign their international communications networks. It does mean, though, that firms should be on the lookout for the same pitfalls that are the daily bread of many of their European counterparts. Realism is key.

"European communications does not exist," says Audrey Mandela, director of European research at the Watford, UK-based Yankee Group Europe. "There is a lack of true European networks, and telecommunications services are uncoordinated."



DAVID POVILAITIS

Despite the many ethnic and cultural links between the U.S. and Europe, the latter's approach to telecommunications is very different from Uncle Sam's. In most European countries, common U.S. networking concepts such as "T1," "Centrex" or "the telephone company" are virtually unknown.

Telecommunications firms are usually a state monopoly, often linked to the mail service. For an analogous situation, imagine AT&T

Boult covers European business and technology issues from Paris.

Competition needed

BY ALAN KAMMAN

Telecommunications standards are a crucial — and controversial — part of the 1992 program. Currently, regulatory guidelines in the European Economic Community (EEC) vary from country to country. But that will change as the EEC encourages a common market in telecommunications equipment, services and transmission — a process certain to invite competition.

The EEC has a tremendous incentive to create a unified telecommunications market. No EEC nation represents more than 6% of the world's telecommunications market, but the EEC as a whole equals some 20%. The EEC commission's telecommunications green paper (initiated to provoke debate; a white paper gives final directives to be implemented) estimates that by the year 2000, up to 60% of all employment opportunities in the EEC will depend on voice, data and imaging technologies.

The commission believes Europe's survival as a technological world power is directly related to its establishing a world-class telecommunications industry. To do that, Europe must maintain a solid research and development capability. Conversely, the worry expressed by non-EEC telecommunications exporters, such as the U.S.

Kamman is national director of telecommunications markets at KMPG Peat Marwick. Reprinted with permission from *World*.

- **Regulated national monopolies dominate**
- **Technical issues loom large**
- **'European communications does not exist'**

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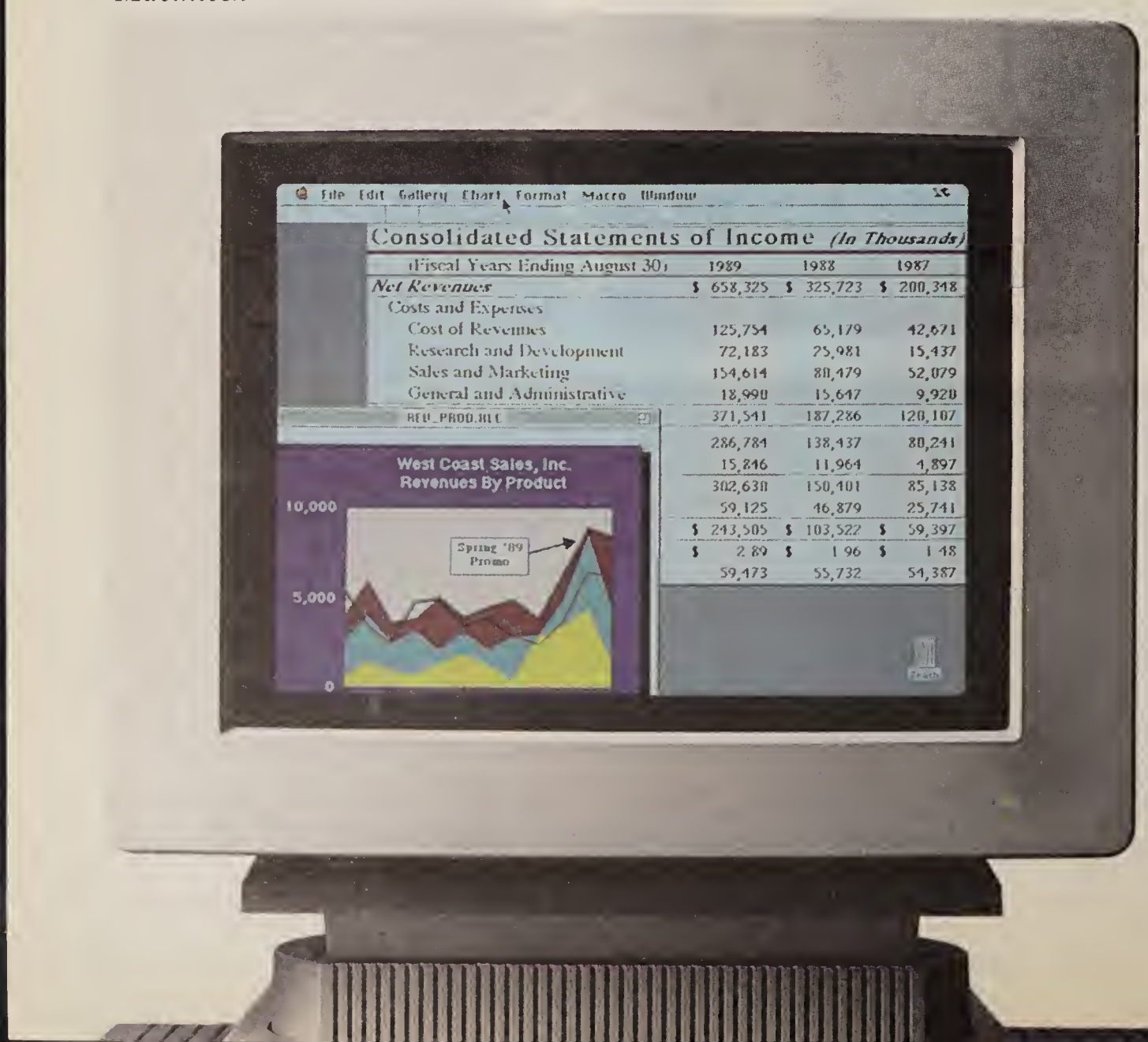

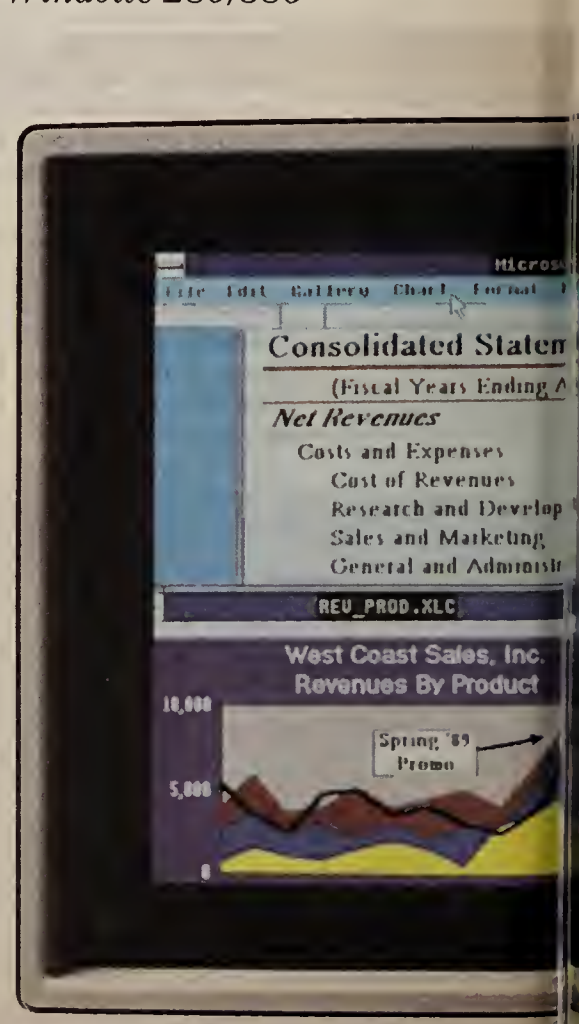

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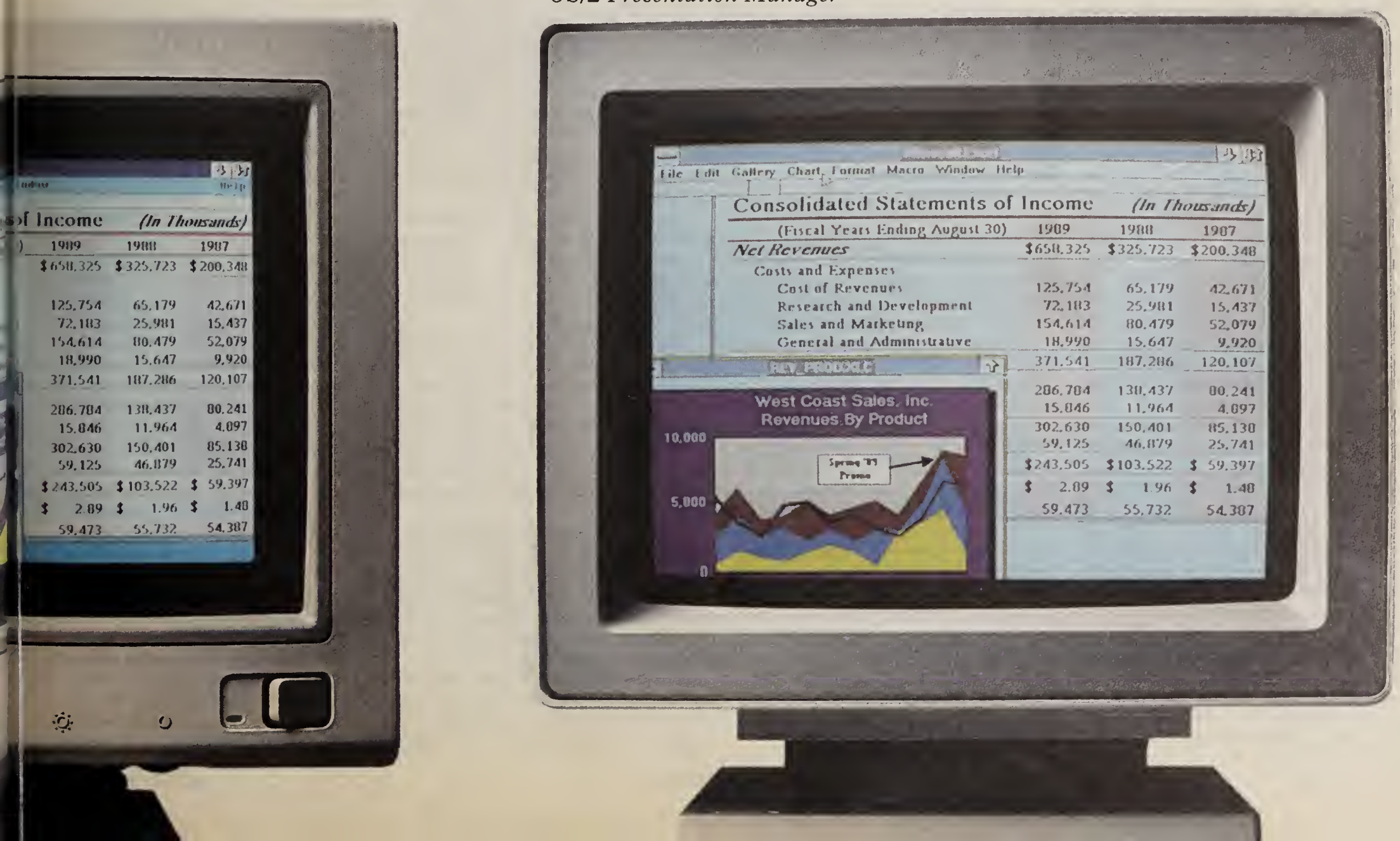

Boult

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and the U.S. Postal Service being part of the same organization.

In other words, the person from whom you order a telephone line has the same legal status as a federal employee. Even in the UK — the only major European country even remotely approaching deregulation — privatized British Telecom, Inc. still has a de facto monopoly in many areas.

But monopolistic practices can have far-reaching effects. In France, for instance, the political clout of the several hundred thousand telecommunications and mail personnel — who have a vested interest in maintaining their status as public employees — has enough impact to sway the results of the country's notoriously close-run presidential elections.

The result is that a succession of ministers have run into political trouble by wrestling with the tricky question of telecom deregulation.

Trying to avoid mistakes made by his predecessors, Paul Quiles, the incumbent minister of the Poste, Telecommunications, Espace (PTE), recently advanced deregulation proposals. A Socialist, Quiles said that he thinks his right-wing predecessor went too far in deregulation, and it seems clear that he has no intention of going any further. These measures, however, were seen by some as a vague plan for separating mail and telecommunications operations, with the French state holding on to its monopoly of both.

More positively, the West German Deutsche Bundespost, the nations's mail and telephone organization, recently took a major step toward deregulation by forming three state-controlled companies to handle telecommunications, mail and mail-order checks and the Post Office savings bank.

In West German telecommunications firms, leasing transmission lines and telephony are to remain a state monopoly. Under the plan, other services of major infrastructural interest will be designated by government decree.

Provision of these services by the Bundespost will be obligatory, but "fair competition" will be allowed. All other services are deregulated, in theory at least, except for restrictions on the number of radiotelephone operators and data protection considerations.

However, these West German moves are viewed just as skeptically by liberalizers. The fragmentation that has resulted from various European telecommunications firms going their own way for so long can be quite dramatic. The UK boasts a heavy concentration of 2M bit/sec. leased lines, a result of heavier business demand and a deregulated telecommunications environment.

Just across the English Channel, France's specialties are notably videotext — some 80% of the world's videotext terminals are "Minitels," a trademark of France Telecom, the corporate name of the French telecom monopoly overseen by the PTE — and Integrated Services Digital Network (ISDN), although West Germany is rapidly catching up in the latter field.

One European organization that has succeeded in implementing an international network is BNP, France's largest commercial bank.

BNP features 14.4K bit/sec. leased lines linking Paris to nodes in New York, London, Hong Kong and Singapore. The London node is linked to New York and Hong Kong. A consortium of PTTs bought majority control of the network from Computer Science Corp. This acquisition was seen by some observers as an important development because it exemplifies the international infrastructure. Paris and Singapore also are linked through the two countries' respective packet-switching systems — Transpac and Telepac.

The BNP system highlights an important element in international networking: managed network services (MNS), which uses national telecommunications infrastructures for local connections.

In addition to Infonet (in which several PTTs have a stake), U.S. firms IBM and GE Information Services have Pan-European MNS offerings. Furthermore, great discussion has surrounded the Conference of European Postal and Telecommunications Administrations' proposed adoption of "one-stop shopping" policy for international leased lines.

Mandela predicts that over the next five years, "Networks will feature international extensions and the integration of voice and data. Corporate networks will be extended to customers and suppliers, while migration to OSI standards will be facilitated by the introduction of ISDN."

Indeed, Europe appears to have something of an ISDN headstart, compared with other advanced regions such as North America and Japan.

In this context, Gerard Schrader, chief executive officer of CAP Sesa Conseil, a subsidiary of one of Europe's leading software and services houses, recently studied ISDN user expectations. Schrader concludes, "For the foreseeable future, major traffic flows will remain transactional, including file and document transfers and messaging. Success in migrating these to ISDN depends on significant cost reduction and nationwide availability of the technology. Inter-company exchanges are a good opportunity for ISDN. The latter may displace some of the current switched or leased-line services if cost-effective." •

Europe's growing network backbone

Despite optimistic projections, analysts question whether the growth in T1 lines will be fast enough to meet international networking demands

	Leased 2M bit/sec. lines			
	1988	1989*	1990*	1991*
UK	8,500	13,000	19,000	25,000
France	400	500	600	650
West Germany	85	200	325	475
Netherlands	25	75	175	300
Sweden	15	25	35	45
Spain	0	0	50	125

*Projected

SOURCE: YANKEE GROUP EUROPE

CW CHART: DOREEN DAHLE

Kamman

CONTINUED FROM PAGE 91

and Japan, is that such research will result in EEC-type standards, politics and regulations that will close the market to outsiders.

Getting a busy signal

However, technical and regulatory issues will make revamping the communications network no easy task. For one, the Postal Telephone and Telegraph (PTT) administration in each member nation has heavily regulated telecommunications, while the computer sector has been given freer competitive reign.

Second, the regulatory and research environment outside the EEC is highly competitive. The International Telecommunications Union (ITU), an intergovernmental correspondent agency of the United Nations, is already committed to resolving global telecommunications issues.

While each of the ITU's 166-member nations reserves the right to regulate its own systems according to national laws, these laws must be compatible with international standards to ensure that each of the world's 500 million telephones can communicate with one another.

Now, interconnection among the world's multimillion terminals, workstations, facsimile machines, computers and videos is the primary issue.

While the creation of a single telecommunications market will clearly open up opportunities, there is growing concern outside the EEC that new standards will limit the market to outsiders. Non-EEC telecommunications exporters point to several developments that signal such a possibility.

One is the EEC's increased focus on research. In its effort to establish a world-class telecommunications industry, the EEC Council approved the European Strategic Program for Research and Development of Information Technologies, an organization researching projects in the information technology area.

The council then funded the Research and Development Program in Advanced Communications for Europe to concentrate specifically on telecommunications research that could lead to standards favoring EEC-based companies.

The U.S. should know. Prior to the 1984 deregulation, the Bell System purchased virtually all of its switching equipment and most of its transmission equipment — which together total about 70% of the capital costs of installing a telephone system — from U.S. manufacturers, primarily from its own Western Electric Co.

The reasons relate directly to the profitability of the parts of the Bell System that were regulated by the government as a legal monopoly and the manufacturing entities that were not regulated. Since deregulation, offshore manufacturers have had a field day selling in the U.S.

Perhaps one of the biggest concerns centers on the provision of basic services. National PTTs want to continue their monopoly on regulating basic services (sometimes referred to as reserved services), while permitting competition for value-added services. But that's where questions arise.

The PTTs' definition of basic services — telephones and telex — has blurred as technological developments now enable computers to transmit data and images.

An even greater worry is that reserved service regulations will refer to all voice and basic data communications. Thus, a company could not build its own fiber-optic or microwave network or use private teleports for satellite transmission without approval and regulation by the PTT. In the past, EEC administrations have been extremely conservative about permitting the construction and use of private networks.

Outside looking in

The green paper proposes other policies that concern non-EEC suppliers — for example, PTTs continuing to have special rights or exclusivity in operating the network infrastructure. No need for MCI Communications Corp. or U.S. Sprint Communications Co. to apply here.

However, the paper also espouses some positions that are encouraging for outsiders, including "free, unrestricted pro-service providers, full application of the community's commercial policy to telecommunications."

Not all the proposed changes will necessarily attract U.S. and other foreign competition to the EEC. But the telecommunications market will clearly become more open than it has been. World economics can no longer tolerate isolationism, and no group knows this better than the EEC.

Increasingly, all nations, both within and outside the EEC, need to cooperate and expand together. Otherwise, they will not grow individually at all. •

London calling

Michael L. Ford, president of British Telecom, Inc., quoting organization Chairman Ian Vallance on the importance of The Integrated Services Digital Network to BT. Excerpted from a speech given at Info, Oct. 11, 1989, in New York.

"I hesitate because my personal view of ISDN is agnostic. I don't lean to the extreme that says ISDN is a solution seeking a problem, but I do wonder whether we foresee the market moving in such a way that we can say, 'Yes, ISDN is the greatest thing since sliced bread, and it is our main future for the network.'

"[ISDN] will have a strong place in the UK — no question. But I don't see it as the blanket solution that certain others do. There is a European view that ISDN is the future; I think it is just one part of the future. Some customers and carriers will have their own ISDN, and some will want something else. Since many of the features of ISDN are already available in other ways, unless ISDN gives something that is easier or cheaper, where is the joy in it?"

Mattel's European net may need upgrade

BY ELISABETH HORWITT

With approximately 50% of its corporate revenue from overseas sales, Mattel, Inc. is closely tracking changes in the European business climate — and seriously exploring ways that its business and networks can benefit from the upcoming economic unification in 1992.

Early this year, the Hawthorne, Calif., firm implemented a private international network to link U.S. sites with manufacturing facilities in the Far East and with marketing and distribution facilities in Europe.

The toy manufacturer is filling up the network's bandwidth with all the data, voice, telex and facsimile traffic it can handle, according to Jeffrey Harris, Mattel's director of information technology. The network, however, was designed to support Mattel's current European operations, which treats each country as a separate market, Harris says.

> "WE WOULD love some organization in Europe that says, 'I can lease you any bandwidth you want, anywhere you want.' "
>
> JEFFREY HARRIS
> MATTEL

Mattel is evaluating the idea of taking a more unified approach to its European inventory, distribution, accounting and marketing facilities. "We would be treating countries in Europe very much the way we treat states in the U.S.," Harris says.

If this happens, Mattel will also have to upgrade or possibly redesign its network to handle the increased communications traffic among European sites and between Europe and Mattel's information system centers in the U.S.

Inventory is one key area of Mattel's business that will be affected if 1992 brings the expected changes. Right now, Mattel has autonomous distribution centers in each country; it cannot, for instance, use an oversupply of Barbie dolls in West Germany to fill an unexpected order backlog in Spain. But if trade barriers go down, the company could set up a common inventory system that would match supply and demand across the entire European market.

Such an arrangement, Harris says, would be particularly helpful during the critical period from August through October, when Mattel pulls in 40% to 50% of its sales. During this time, he adds, "You have to be a soothsayer to predict where the stuff will end up."

Packaging, of course, as well as the language used for written material, differs among European countries. But, according to Harris, "If we were able to put the raw product in common warehouses and perhaps do packaging locally, the products would be available immediately to meet the demands of a given country."

Another potential change in Mattel's European business operations would involve coordinated book closings across all the affiliates, Harris continues.

But to implement such corporate applications, Mattel's international network would need a massive upgrade to support increased communications needs, according to Harris.

Currently, one big obstacle is that the networking bandwidth and services Mattel would need are only available in certain countries. However, there is hope that as 1992 ushers in a new era, "the barriers and restrictions that control communications across European borders will be modified to facilitate the European common market," Harris says.

A top priority on Mattel's list is uniformity of transport services among different countries, Harris says. Right now, each nation differs in terms of the amount of available bandwidth, types of services offered and pricing structures.

For example, Mattel currently connects its U.S. operations to Europe via satellite link to UK, which then fans out to other countries. Some of those countries support satellite links; others do not, requiring terrestrial connections, Harris says. Mattel would also like to be able to fill its trans-European networking needs through one vendor, instead of having to deal with each Postal Telephone and Telegraph (PTT) authority individually, Harris says. "We would like to see some long-haul carriers that can cross borders without getting involved with PTTs, so from a worldwide control point of view, we would have fewer points of interface."

Mattel's international network is controlled from Phoenix, and Harris says that "if we have a line problem in France, we have to get involved with several different suppliers and vendors to pick up all the links."

"We would love some organization in Europe that says, 'I can lease you any bandwidth you want, anywhere you want,' " Harris continues. "We'd be having dinner with them right now, but they don't exist." •

Horwitt is a *Computerworld* senior editor, networking.

"Sir, some of the exhibitors would like to talk to you about the rental equipment."

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AT&T computers mean faster recoveries at Rush-Presbyterian-St. Luke's Medical Center.

Front to back:
Leo Henikoff, M.D., President,
Rush-Presbyterian-St. Luke's Medical Center

Bill Wellman,
Assistant Vice President of Administrative Affairs,
Rush-Presbyterian-St. Luke's Medical Center

Dan Byers,
AT&T Data Sales Executive

Chicago, Illinois
May 4, 1989

Rush didn't want to just survive cost-cutting in the healthcare industry. They wanted to flourish. So to help them compete better, and treat their patients better, AT&T prescribed a distributed networked computing solution. Rush's Leo Henikoff, M.D., Bill Wellman, and AT&T's Dan Byers review the hospital's new Patient Care Information Network.

Rush: You know, it's been a tough time for hospitals. But even though 10 in Chicago have closed, we're doing well. Especially with the new system.

AT&T: Now that your information barriers are gone.

Rush: That's right. Before, no one was really linked up. Our doctors couldn't access clinical data and pharmacology on the same terminal. To make matters worse, some departments were actually duplicating data entry.

AT&T: But now many of your departments are networked. And not just those throughout your campus—but all over the Chicago area.

Rush: It's easier too, since it's one system now. Our AT&T 3B2 Computers make great file servers to our mainframes. And with your 6386 WGS desktops at the nursing stations, data is right at the end of a light pen. In fact, our residents say they're saving hours in run-around time.

AT&T: Don't forget about the AT&T StarLAN and StarGROUP network that link your Compaq and IBM PCs with the AT&T WGS computers.

Rush: Sure. Plus the AT&T ISN is the heart of our network. It links an IBM 3083 for accounting, a VAXcluster for lab tests, a Tandem host for pharmacy records, and AT&T 3B2's. And because we move around so much, the ISN and AT&T SYSTIMAX PDS let us plug displays or PCs into any jack.

AT&T: So, do you think another solution would have had the same value?

Rush: Not really. There are viable alternatives out there. But AT&T is the most cost effective. Other vendors aren't really one-stop-shops either. You helped us integrate a very complex group of systems, trained us, plus you're always there for us. Now *and* when we expand.

AT&T: What about your clinical staff? Have they noticed the change?

Rush: Without a doubt. Our doctors and nurses can now spend much more time with patients since they have faster access to information. Bottom line, we feel good about going with AT&T.

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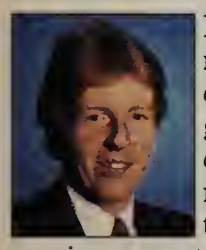
INDUSTRY INSIGHT

Paul Gillin

Can you say 'finance?'



Every three months, American business goes through a chaotic little ritual known as the quarterly earnings report. As we all know, this is the time when publicly held companies have the chance to come completely clean with the market, putting forth both the good and bad news that shareholders can use to make wise investment decisions. At these times the emphasis is on truth. Veritas. Pravda.

Well, maybe not completely. As a longtime reader of unadulterated earnings statements, I have assembled a brief guide to financial-speak to help you find truth amid hyperbole. Statements are written first in Earnings. English translations follow:

• **Opening lines:**

"Wump Corp. today announced significantly higher revenue and profits for the quarter." *Everything's fine right here at ol' Wump Corp.*

"Wump Corp. today announced higher revenue for the

Continued on page 102

Tweaking the 'ideal' merger

ANALYSIS

BY NELL MARGOLIS
CW STAFF

VIENNA, Va. — Forget the publicists. Last year's merger of systems software tools providers Morino Associates and Duquesne Systems, Inc. was so well-received that customers were slinging around terms like "merger of equals" and "wedding of the year."

At a time when the urge to merge was suddenly sweeping the computer industry and creating more than one questionable alliance, a user of wares from both Morino and Duquesne said of the combination: "If they can't make it, no one can."

Eleven months later, former Morino founder/Chief Executive Officer and current Legent Corp. Chairman Mario Morino is not about to contradict him. However, Morino told *Computerworld* in a recent interview, even in a dream marriage, merging is no endless honeymoon.

For starters, Morino said, there is no such thing as perfect compatibility. Morino and Duquesne, for example, shared goals, ethics and customers. However, Duquesne — together as one company for a longer, stable period of time — was centrally managed, "with an open flow upward for decision making." Morino, which had grown quickly through acquisition, tended toward decentralization.

"When we confronted each other," said former Duquesne Chairman/CEO and current Legent CEO Glen Chatfield, "we found that we had common views but very different ways of operating to reach them. The differences were bigger than we thought they'd be." In Legent's case, Chatfield said, the problem turned into a plus: "It ended up driving consolidation faster," he said. Legent executives and

Legent's Morino *says merging isn't an endless honeymoon*

managers, determined to preserve the "ideal couple" image in fact as well as in print, sought expert help. They brought in as a consultant Arnoldo Hax, deputy dean of MIT's Sloan School of Management. Among other measures, Hax guided 45 people, drawn from both the Morino and Duquesne camps, through a 2½-day motivational team-building meeting, followed up by intermittent meetings over a several-week period.

"We came out of that meeting with a coherent statement of direction for Legent," said President and Chief Operating Officer Peter Barris. In addition, he said, "People came away with respect for the other side — with a feeling of: Hey, they've got some good people, too."

Meanwhile, Morino said, even as the real differences were being addressed, the apparent difference between the vaunted ideal merger mates became an issue in and of itself.

"Perception problems become real problems," he said. "Everyone worried about which way we'd go, what would hap-

Continued on page 102

Ashton-Tate looks to future with Dbase 1.1

BY CHARLES VON SIMSON
CW STAFF

TORRANCE, Calif. — Even the news of one of the worst quarters in the company's history could not distract observers from the protracted vigil for the birth of Ashton-Tate Corp.'s Dbase IV Version 1.1, which entered beta testing as the financials were announced recently.

As expected, Ashton-Tate announced dismal third-quarter results earlier this month, posting a $19.4 million loss. But while the financials were bleak, no observers were caught off guard. The company's troubles are old news, and everyone is simply waiting to see how Dbase Version 1.1 will play in the market once it is available.

"We were all expecting a lousy quarter, and we got one," said Thomas Galvin, who covers Ashton-Tate for Smith Barney, Harris Upham & Co., a New York brokerage. "The inventory problems are a visible, important problem, but the long-term issue is the health of Dbase IV." Ashton-Tate stock remained steady on Wall Street. Analysts said they believe that prices had already been adjusted with the initial news of the Version 1.1 delays late this summer.

The Dbase product line accounts for about 65% of Ashton-Tate's revenue. The newest version, Dbase IV, had been plagued both by software bugs in the initial release, and overselling into the distribution channel.

Continued on page 106

Q3 earnings show refusal to be stuck in market mire

BY NELL MARGOLIS
CW STAFF

A heartening number of high notes continued to be struck last week as third-quarter computer industry earnings reports sounded the theme that individual companies are finding ways to manufacture, market and partner their way beyond a generally sluggish market.

"Databases are commodity items these days," one Wall Street analyst said several weeks ago, explaining disappointing third-quarter prospects at Alameda, Calif.-based Relational Technology, Inc. That is probably not the prevailing market view, however, in Menlo Park, Calif., where Informix Corp., one of last year's wounded firms, is back in the high life again.

Chief Executive Officer Phil White credited several large contracts, including a huge OEM agreement under which Unisys Corp. will sell Informix products worldwide, with a third-quarter revenue boom that in turn fueled the company's 2,000% profit explosion.

Nor, apparently, are database machines a universal commodity. Teradata Corp., which this year topped *Inc.* magazine's list of the 100 fastest-growing small companies in the U.S., saw its third-quarter revenue jump 69% over last year's third-quarter sales figure, while third-quarter profits grew 57% in the year-to-year comparison.

Storage Technology Corp. is feeling less blue this quarter by feeling less Blue, according to CEO Ryal Poppa. Strong sales of 4400 Automated Cartridge System (ACS) tape products helped boost Storage Tek's profit by 1,283%, he said, adding that the company continues "to aggressively expand the market opportunity for the ACS library by introducing it into new, non-IBM computer environments." A third-quarter contract with Bull H. N. Information Systems is the most recent example.

Mentor Graphics rode countercyclical strength to third-quarter jumps in both revenue and net income, CEO Thomas Bruggere said.

A marked high in sales and orders, he said, resulted from customers' embracing electronic design automation as a weapon to pit against a generally sluggish market.

For survivors of the recent shakeout, the disk drive niche is a comfortable address, according to analysts. Further validating their observations, Conner Peripherals, Inc. checked in with third-quarter revenue of $184 million, up 172% from last year's

Continued on page 101

1989 third-quarter earnings

Banner quarters for many companies question rumored slump

	Revenue July through Sept. (in millions)	Percent change from 1988	Net income July through Sept. (in millions)	Percent change from 1988
Amdahl	$534.3	15%	$32.9	(37%)[1]
Computer Associates	$282	5%	$9.6	(66%)
Computer Sciences Corp.	$371.7	24%	$13.5	13%
Comshare	$22.1	17%	$1.1	100%
Control Data Corp.[2]	$763	(9.3%)	$9.8	—
Convex Computer	$41.2	50%	$3.1	87%
Cray Research	$210.2	45%	$30.6	36%
Informix Software	$37.2	57%	$2.1	2,000%
Mentor Graphics	$96.4	24%	$11.5	31%
Storage Technology[3]	$232.6	12%	$8.3	1,283%
Stratus	$83.7	22%	$8.4	12%
Teradata[4]	$42.98	69%	$1.95	57%
Wyse Technology	$119	(8%)	($3.6)	—

[1] Parentheses indicate decrease or loss
[2] Includes results of Imprimis, the disk-drive subsidiary sold to Seagate Technology at the end of the quarter
[3] Financial statements for periods prior to May 26 have been restated to reflect pooling of interests with Aspen Peripherals Corp.
[4] Includes $466 million reduction of income taxes due to net operating loss carried forward

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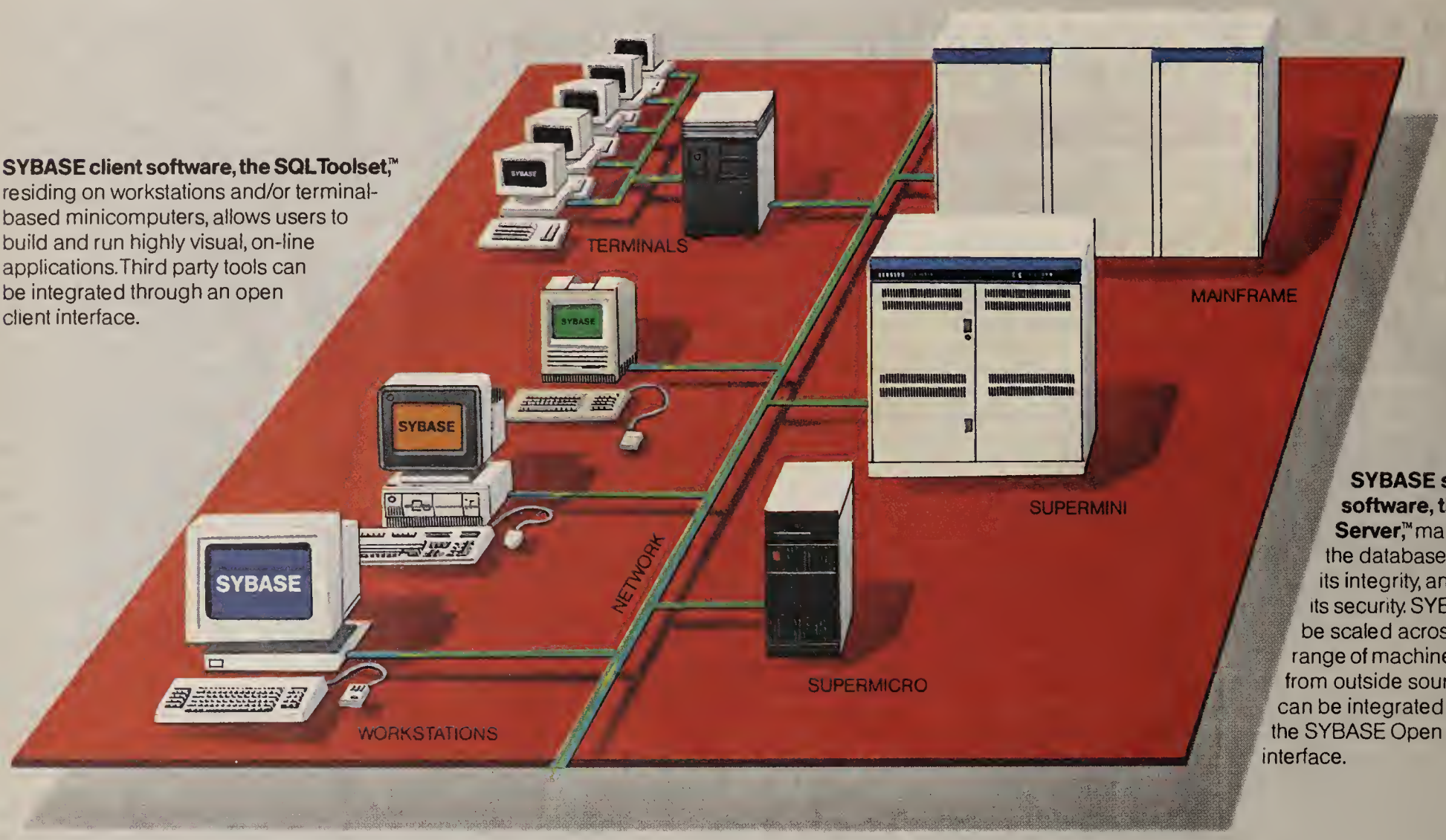

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Pressure holds on Brazil trade

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The Bush administration has dropped its official trade complaint against Brazil's protectionist "informatics" policy, but U.S. pressure on Brazil to open its computer and software markets to foreign vendors is expected to continue.

Industry groups such as the American Electronics Association said some progress has been made, but they urged the U.S. to undertake aggressive negotiations to remove remaining trade and investment barriers.

Ending the trade investigation will "create a more positive, relaxed atmosphere in which discussions to resolve outstanding issues can take place," said John L. Pickitt, president of the Computer and Business Equipment Manufacturers Association (CBEMA), in a statement.

U.S. Trade Representative Carla A. Hills said the 4-year-old investigation was terminated on Oct. 6 because Brazil has relaxed some policies that restricted foreign access to its hardware and software markets. Brazil recently passed a law giving software copyright protection, allowed some sales of U.S. software and will permit the revenue to be repatriated to the U.S.

Hills said further progress in software trade and other forms of market access will be pursued. To continue the bilateral discussions on informatics trade and investment, the U.S. and Brazil agreed to consult regularly, at least four times a year, she said.

Remaining issues of concern to the industry include the high tariffs for imported electronics products, widespread software piracy, restrictive foreign investment rules and regulation of technology-transfer contracts by Brazil's National Institute for Industrial Policy.

The Reagan administration had threatened to impose $105 million in punitive tariffs but postponed the sanctions when negotiations with Brazil began to make some progress [CW, March 7, 1988].

Brazil began restricting high-tech trade in 1977 to protect its computer industry from foreign competition and allow domestic vendors to prosper.

Earnings

FROM PAGE 99

comparable period. Conner marked its 11th consecutive profitable quarter with $11.8 million in net income, up 72%. The company also saw a quantum leap in international presence; responsible for 18% of last year's third-quarter revenue, international sales contributed approximately 57% of revenue for the quarter ended Sept. 30.

Continuing vitality in the microcomputer software sector powered Software Publishing Corp. past the $100 million mark for the year. The Mountain View, Calif.-based company reported $30.6 million in revenue for the calendar third quarter and its fiscal fourth quarter — a 28% increase over last year's comparable period. Profits for the business productivity software company increased 16.3%, to $5 million.

On-line transaction processing are still words to conjure with: Stratus Computer, Inc. reported third-quarter revenue up 22% to $83.7 million and profit up 12% to $8.4 million.

Also backing the age-old premise that the rich get richer, Compaq Computer Corp. reported revenue up 36% to $683 million and net income up 51% to $87 million for the quarter ended Sept. 30. Supercomputer player Convex Computer Corp. recorded its 20th consecutive quarterly revenue increase, as well as an 87% profit gain.

On a more sobering note, Cray Research, Inc. reported healthy quarterly increases but cautioned that the year-end picture is likely to be less rosy.

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Technology which allows small satellite earth stations to transmit and receive voice, video, and data information in complete privacy helps smaller companies enjoy the advantages of satellite communication services. Hughes Aircraft Company has established and is operating earth station facilities which can be shared among many users as the central control point for their independent networks. When combined with Very Small Aperture Terminal (VSAT) stations using advanced transmission techniques, Hughes' shared hub facilities allow companies to quickly and cost-effectively establish their own private, customized, satellite-based business communications networks. The first three Hughes shared hubs are located in New York, Los Angeles and Minneapolis; additional sites will be added in the future.

A new radar maintenance facility will assist the Portuguese air force in the maintenance of three sophisticated air defense radar systems. Being built by Hughes, the Intermediate Support Facility (ISF) will include a Hughes HMC-193 Microcomputer Aided Tester for digital assembly test, and an Integrated Test and Logistic Support System, which does depot-level troubleshooting and repair of complex analog and radio frequency assemblies. Hughes is supplying the radars for the NATO Southern Region and Portugal (RSRP) Program, which supplies data to the Portuguese Air Command and Control System. The ISF will allow Portugal to autonomously maintain their radar systems.

A revolutionary three-dimensional architecture will result in an ultra-fast supercomputer that fits into the palm of a hand. A 3-D computer, under development by Hughes for the U.S. Air Force, uses a three-dimensional array of processors to achieve an extremely high degree of parallel processing. The array of processors is distributed vertically on integrated circuit wafers, stacked one on top of another, eliminating circuit boards, chip packages and connectors. This allows as much as 90 percent of the computer to be active silicon circuitry. Final versions of the computer will handle 100-billion operations per second for applications like image processing, radar signal processing, and space-based missions.

An advanced semiconductor packaging technology will permit maximum utilization of the next generation of integrated circuits. Using packaging techniques based on its high-density multichip interconnect (HDMI) technology, Hughes will design, develop, fabricate and deliver test modules and large-area multi-chip packages for the Naval Ocean Systems Center. HDMI uses fine-line integrated circuit processes to build the substrate circuitry in a hybrid package. The packaging technology is aimed at meeting the need for higher density modules that operate at high speed using very-large-scale integrated circuits.

Hughes Technical Services Company (HTSC™), a subsidiary of Hughes Aircraft Company, is rapidly expanding its contractor operations and logistics support to meet individual and customer program requirements. Upcoming military contracts to be supported by HTSC include simulators for the T-45 Goshawk, Fleet ASW Team Training and Landing Craft Air Cushion. HTSC presently needs engineers, programmers and field service technicians with experience in simulation in order to keep pace with new contract requirements. Qualified candidates may send resumes to: Hughes Technical Services Company, Trainer Support, Dept. S3, P.O. Box 90962, Long Beach, CA 90809. Equal opportunity employer. Proof of U.S. citizenship required.

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HUGHES

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Gillin

CONTINUED FROM PAGE 99

quarter." *We'd rather not talk about profits.*

"Wump Corp. today announced its quarterly financial results." *But you don't have to read them — really.*

"Wump Corp. today announced a significant loss on a decline in revenue." *If anyone is looking for a good investor relations person, please give me a call.*

• **Rationalizations:**

"This year has seen the company pursue many new opportunities." *All our existing markets have dried up.*

"We do business in a dynamic marketplace." *The competition is beating our brains out.*

"The decline in income was due to market shifts and changing foreign exchange rates." *The competition and the Japanese are beating our brains out.*

"The market continues to exhibit extreme volatility." *Our executives are short-selling our own stock.*

"Recent trends have been encouraging." *The class action suit was dropped.*

"The company continues to exhibit strong performance in its core markets." *We aren't getting any new customers.*

• **Executive changes:**

"Mr. Mudthing has resigned from the presidency to pursue other interests." *It was in Mr. Mudthing's best interest to clear out his office.*

"Mr. Mudthing has resigned for personal reasons." *Mr. Mudthing was personally asked to clear out his office.*

"Mr. Mudthing's resignation was by mutual agreement." *Everyone agreed that Mr. Mudthing's office would look much better cleared out.*

"The board of directors asked Mr. Mudthing to resign." *About that class action suit . . .*

• **Restructuring:**

"The intent of the reorganization is to make the company more responsive to our customers' needs." *Our customers didn't need those 3,000 employees anyway.*

"The reductions were made possible by significant economies of scale in the manufacturing area." *There's no work to do.*

"Mr. Mudthing will head up the new Middle East/Africa division." *Where he will never be heard from again.*

• **Chief executive quotes:**

"We are a market-driven company." *Our products stink, but we spend a lot on advertising.*

"We are a technology-driven company." *Our products are fine, but the marketing director is the CEO's nephew.*

"Our design team is first-rate." *Too bad the manufacturing people are a bunch of morons.*

"The rumors that we are looking to be acquired are absolutely false." *Everyone has turned us down already.*

"I'm sorry to see Mr. Mudthing go at this time." *I wish we had fired him before he mucked up everything.*

Gillin is *Computerworld's* executive editor.

Legent

CONTINUED FROM PAGE 99

pen." Here, as in all other aspects of smoothing the way from Duquesne/Morino to Legent, the company's board of directors was an invaluable resource, Morino said.

"Joe Henson gave us a great insight," he said, mentioning the former CEO of Prime Computer, Inc. as just one of the several "active but not interfering" members of the board. What Henson recommended, Morino said, was a process by which the company's overall activities were factored into a list of discrete functional actions. "We then took each corporate officer and set out that person's function with respect to each separate action, asking: What does X do in Y instance — initiate, review, authorize or communicate?" The review process, Morino said, "didn't solve the whole problem — but it went a quantum step of the way."

Anxiety over big problems, including those that do not materialize, is only the second greatest pitfall for the newly merged, Morino said. Looming even larger is the list of things no one would have thought to put on a list.

Barris *found respect for other side*

One such instance at Legent, Morino recalled, arose when a Morino developer started wearing a floor-length blue lab coat, unwittingly starting a fashion craze. "Before you knew it," the chairman said, "everybody wanted to order one — but they would have all had 'Morino' on them."

Too small an issue to bend large minds out of shape? Not during the tender time in which a merger is taking root, Morino said.

"Assume nothing about anything, regardless of how small it is," Morino cautioned. In the post-merger atmosphere, "anything can become a political issue, and usually does." Business integration committees are not likely to spend a lot of time worrying about what the new firm's business cards are going to look like, Morino said — but that's as likely to stall the smooth integration of the merged firms as is a foreseeably major issue like which sales force handles what, and for whom.

With two populations trying to accustom themselves simultaneously to new identities, loyalties, assignments and work styles, not to mention employees, colleagues and bosses, Morino said, something akin to temporary paranoia pervades the firm. "If I sneeze, or Glenn, or Peter, suddenly there are 70 rumors about flu or colds — or death," he said.

> IN THE POST-MERGER atmosphere, "anything can become a political issue, and usually does."
>
> MARIO MORINO
> LEGENT

What's more, since it is equally well-known that acquisitions are a linchpin of Legent's growth plan and that Morino is Legent's point man in the acquisition arena, "cab drivers are always getting quizzed about my travel plans by people trying to figure out who I'm meeting with and what we might be looking to acquire." Since the Sherlock syndrome does not stop with cabbie-quizzing, Morino said, he has had a shredder installed next to his desk at home.

Chatfield *saw a problem turn to plus*

To quell anxieties on a broader level, Legent has instituted the FYI program. Under this initiative, analysts' reports and other important information about the company are mailed to the homes, rather than the hectic offices, of some 50 key company personnel. "This counteracts one of the biggest fears after a merger," Morino said, "the fear that you don't know what's going on."

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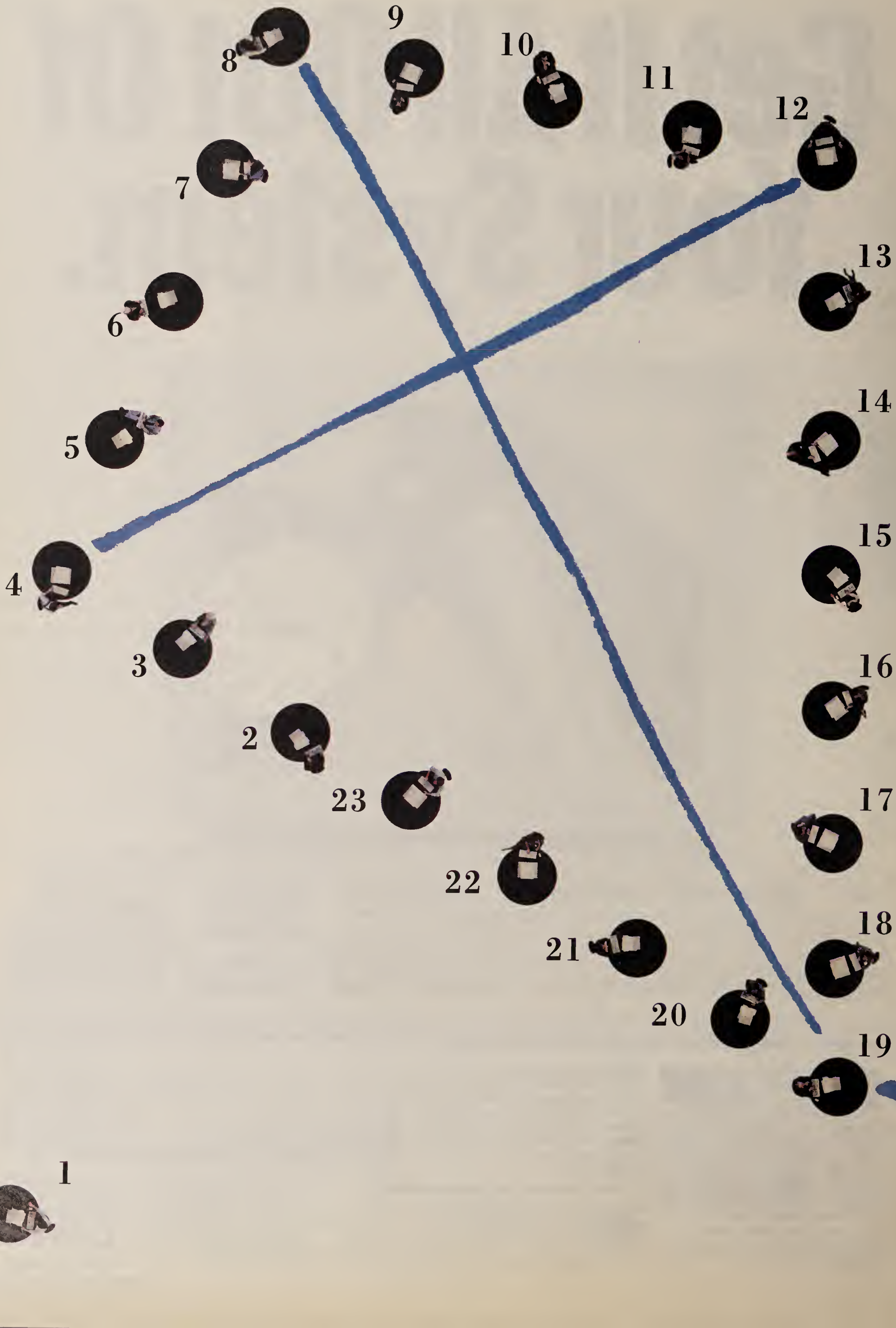
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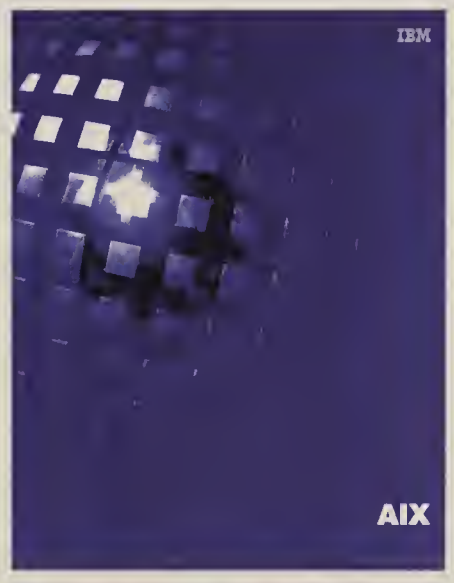

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IN BRIEF

Tit for tat

Disgruntled **Datapoint Corp.** shareholder Martin S. Ackerman has filed a counterclaim in U.S. District Court in N.Y. against Datapoint and its chairman, Asher B. Edelman. The suit alleges, among other things, that Edelman and Datapoint are deceiving shareholders and tainting Ackerman's solicitation process for the sole purpose of entrenching Edelman and the current board of Datapoint.

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Sun taps DEC exec

Seventeen-year **Digital Equipment Corp.** veteran Kevin Melia last week was named vice-president of worldwide operations at **Sun Microsystems, Inc.** Melia, 42, was vice-president of corporate distribution and materials at DEC and an officer of the company. He will assume his new post Nov. 7.

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Memories in motion

U.S. Memories, Inc. has chosen four finalists from among 57 on its list of possible headquarters sites. The joint venture of semiconductor makers and consumers will inspect sites in Austin, Texas; Colorado Springs; Middletown, N.Y.; and Phoenix. The final site is expected to be chosen next month

. . . . . .

Top of the heap

IBM was the picture of emergent systems integrator pride last summer when it won the prized contract to manage **Eastman Kodak Co.**'s data processing operations. Last week, however, the company smiling for the camera was **DEC**, whose bid to manage Kodak's voice and data communications business edged out IBM's.

. . . . . .

A magnetic match

National Semiconductor Corp. has agreed to acquire **Krysalis Corp.**, a developer of ferroelectric materials technology. The teaming will result in new memory products for the commercial and military nonvolatile memory marketplace, the chip maker said.

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Adios and good luck

Prime Computer, Inc. Chairman of the Board Russell Planitzer earlier this month relinquished his director's seat at **Miniscribe Corp.**, the Longmont, Colo.-based disk drive maker that was assailed by fraud allegations last month [CW, Sept. 18]. Planitzer, a general partner of venture capital firm **J. H. Whitney & Co.**, said that his recently acquired Prime chairmanship prevents him from devoting the time required to serve at Miniscribe.

Ashton-Tate

CONTINUED FROM PAGE 99

Ashton-Tate Chairman Ed Esber maintains that the channel is clearing and that new shipments will bolster fourth-quarter revenue. Sources close to the company said that Esber and senior executives are looking for a break-even point in the fourth quarter. "Clearly, Dbase has dominated our revenue," Esber said, "but since Feb. 1 we have not sold so much *to* the channel as *through* the channel."

The company, Esber said, has "sold twice as much through distributors as we have to them. The basic demand for the products has been healthy. We had overly ambitious plans, as did the channel."

Some analysts voiced an outlook less rosy than Esber's. Dbase demand does remain strong, they said, and the firm will continue to command about 45% of the PC database software units shipped through this year. "But for the moment they are a one-trick pony," said Nancy McSharry, PC software analyst at International Data Corp. in Framingham, Mass.

Ashton-Tate's Esber

"When your strongest product is having significant problems, it takes a focused effort to get by it. They need to get a solid Version 1.1 out the door before they can get started on their next generation of products," she said.

The company is betting heavily that the problems will be corrected in the newest version, which will be shipped free to Version 1.0 customers. In addition, Version 1.1 will have ties to larger machines and is designed to work with Ashton-Tate/Microsoft's SQL Server, which will allow communication with mini- and mainframe-based databases.

In an effort to provide a note of optimism, the company announced Dbase IV 1.1's entry into beta testing along with the fourth-quarter financials. Esber declined to specify the time frame for the test period.

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World watches as EC mulls software copyright directive

ANALYSIS

BY MICHAEL CONNIFF
SPECIAL TO CW

MONTREAL — The Council of Ministers of the European Community (EC) is on the verge of issuing a directive on copyright protection that could have profound consequences not only for the computer software industry in Europe but also for the software industry worldwide.

EC Council directives require member states of the European Community to change their laws to the extent necessary for compliance. The pending economic unification of European Community countries at the end of 1992 gives the directive process all the more urgency.

At the heart of the proposal for the directive is the contention that software should receive the same protection across national boundaries as "books, films, music recordings or industrial design, if research and investment in computer technology are to continue at a sufficient level to allow the Community to keep pace with other industrialized countries."

Sets example for the world

"The directive could hardly be more important," said Douglas E. Phillips, president of the Business Software Association (BSA), a Washington, D.C.-based trade group representing major domestic software publishers. "It will affect all key aspects of software protection for the European Community in the foreseeable future, and it sets an example for the rest of the world. I'm sure what happens will be cited in China and in other countries."

While the match between software and copyright law, originally scripted to cover media that differ from software in many aspects, has been attacked as less than ideal, the current laws bring with them a distinct pragmatic advantage. "The nice thing about copyright protection," said J. Jancin Jr., IBM's counsel for intellectual property law, "is that it is here — and it is here now."

The disposition of several prickly issues of contention remains to be resolved by Dec. 14, when the Council of Ministers, the primary legislative body of the European Community, is scheduled to adopt its directive on copyright protection.

Among the areas still in question are the enforcement of the directive within EC countries; the establishment of "originality"; the inclusion of "interface protection" in copyright protection; the right to control "restricted acts" such as reproduction and adaptation; the extension of protection to the ubiquitous "shrink-wrap" agreements between publisher and user; the length of copyright protection; and the proposed exclusion from copyright protection of "the logic, algorithms or programming languages" underlying a software program.

In addition, reverse engineering has emerged as a bone of contention that has placed IBM and the major national software trade groups — which vehemently oppose the practice — against Fujitsu and NCR, among other hardware manufacturers.

> "SOFTWARE PIRACY is a major problem in Europe."
>
> DOUGLAS E. PHILLIPS
> BUSINESS SOFTWARE ASSOCIATION

"Reverse engineering is a misnomer when it is applied to computer programming," Jancin told the attendees at the Software Publishers Association conference, held in Montreal earlier this month. Phillips agreed: "We don't want to see anything introduced that says reverse engineering is permissible."

Software publishers in the U.S. are worried about particularly aggressive piracy in EC countries. As Phillips said at the SPA session on copyright protection, "Software piracy is a major problem in Europe." He said pirated copies of such programs as Lotus Development Corp.'s Lotus 1-2-3 and Ashton-Tate Corp.'s Dbase II account for 50% of usage in some EC countries, with the percentages growing even higher in Italy, where Phillips said 186 complaints have been lodged based on illegal software use. The BSA claimed that "software copying by large organizational users in Italy causes aggregate losses to software companies in the hundreds of millions of dollars each year."

Major industry groups such as the BSA and the SPA, also based in Washington, D.C., have replied aggressively to the proposed directive with their own comments. On Oct. 5, they were both among 18 national software trade groups and corporations — from nine countries in Europe and the U.S. — who signed a "common statement" laying out changes necessary for the harmonization of copyright laws regarding software, regardless of national boundaries.

Conniff is a Burlington, Vt.-based writer.

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Leading edge or bleeding edge?

Choosing a platform has risks, but there are ways to avoid disaster

BY SHERYL KAY
SPECIAL TO CW

Upward mobility for information systems managers hinges on several factors, not the least of which is choosing the platforms on which systems will be developed and run. Such decisions can have major ramifications when investments run into the hundreds of thousands of dollars. They also introduce a significant degree of risk.

Given the costs and risks, it is no surprise that Unix-based minisupercomputers and various parallel-processing machines are only slowly finding their way into general business computing. But managers are enlisting the machines for such jobs and hoping they will enhance their careers in the process.

One risk is the fact that vendors of high-performance machines tend to be young. "Who knows if your vendor will even be around in three years? It's not quite as proven as, say, an IBM 3090," says Frank Panella, director of systems development at Dow Jones & Co., which runs its News/Retrieval information service on a massively parallel Connection Machine from Thinking Machines, Inc.

"You're going to have to forget that buying hardware from a traditional, well-known mainframe vendor won't be bad for your career, or you're not going to make any career advancement," Panella says.

Tom Nalley, director of business systems at Raddison Hotels International in Minneapolis, took a similar view when the company became one of the first to use a parallel processor from Sequent Computer Systems Corp. for a nonscientific application.

Sleepless nights

"There were a lot of people second-guessing us because Sequent was a new company," Nalley says. "Those are decisions you tend to lose some sleep over."

However, a number of Raddison employees visited Sequent headquarters in Beaverton, Ore., several times and concluded that price and performance projections made the risk look reasonable. Raddison now operates 16 million instructions per second Sequent Symmetry S81s in two reservation centers.

Similarly, at Northwest Airlines, also in Minneapolis, senior director of operations systems Tom Bozliniski says buying a Convex Computer Corp. C220 for the Crew Utilization System has been a positive move. "I can deliver solutions that will save the company money and improve the efficiency of this airline," Bozliniski says.

Bringing a high-performance computer in-house presents a raft of other concerns. The decision could also hinge on the difficulty or expense of finding or developing the necessary software.

"IBM and IBM clones have owned the market for so long, why bother?" asks James Bottum, deputy director of the National Center for Supercomputing Applications at the University of Illinois in Urbana.

However, Bottum answers his own question: One occasion for developing software is when no commercial applications are available for the job in question. Another is when commercial packages do not measure up to requirements.

> "YOU'RE GOING to have to forget that buying hardware from a traditional, well-known mainframe vendor won't be bad for your career, or you're not going to make any career advancement."
>
> FRANK PANELLA
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Raddison was already using Unix software on an AT&T computer, and converting it took a matter of weeks — "no big deal," Nalley says. Northwest ported its applications from Unisys Corp. 7040 processors and runs a modified application package from Unisys Corp. Dow Jones runs a version of Thinking Machines' document retrieval software that the two companies modified.

Staffing for development on a high-performance Unix computer can be another stumbling block. "The number of available programmers and operations analysts is much smaller than in the traditional DP environment," Bozliniski says. At Northwest, most of the relevant programming positions require a strong background in Unix and Fortran or C, coupled with exposure to mathematical modeling or operations analysis.

The lack of skilled job candidates could lead IS managers to rely on training. Northwest has developed the necessary skills among staff members, prompted by an emphasis on promotion from within as well as the rarity of skilled candidates.

Thinking Machines maintains Dow Jones' Connection Machine and its software. It is training Dow Jones employees to take on more of the work, particularly with regard to the Digital Equipment Corp. Ultrix-based front end.

Since 1986, the University of Illinois supercomputer center has trained more than 2,000 people associated with its time-sharing clients, instructing them in multilayered Unix environments and parallel processing, among other areas. This year, one of those clients, Eli Lilly & Co., announced it would move on from time-sharing and buy its own supercomputer.

Other concerns for managers of high-performance computers include acquiring high-end workstations, juggling the flow of work to minimize processing time and, often, implementing particularly thorough security and backup programs.

On a positive note, a high-performance computing environment can help attract basic recruits. "We interview bright programmers who don't want to be Cobol developers on an accounts payable system," Panella says. "They see our environment here, and their eyes open wide."

Kay is a Tampa, Fla.-based business consultant and free-lance writer specializing in emerging technologies and human resources.

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   - B. Minicomputers/Small Business Computers
   - C. Microcomputers/Desktops
   - D. Communications Systems
   - E. Office Automation Systems
   - F. No Computer Involvement

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MIS

Senior Programmer/Analysts

Successful candidates must have a BS degree in CS, math or an applied science, 6–10 years' experience in programming, with a strong knowledge of C, UNIX, 4GLs, and SQL. An MS degree is preferred.

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These MIS opportunities require a minimum of 8 years' experience implementing effective systems solutions for finance, accounting, manufacturing, or order management in a large manufacturing company. Must have a working knowledge of the supported business functions and processes. Successful candidates should also be knowledgeable in a variety of languages and technology, including 4GLs with SQL, UNIX and C. An understanding of information center and end-user computing concepts is desirable. An MS or MBA, or equivalent, is required.

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The qualified individual will be responsible for developing, analyzing and designing financial software products. We seek a minimum of 5 years Cobol Tandem experience, with applications development experience a must. A BS degree is required.

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The qualified applicant will be responsible for SYSGENs, system tuning and balancing, data base maintenance, capacity planning, system installation and troubleshooting. We seek candidates with a minimum of 5 years experience in a Tandem, Pathway environment.

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A bachelor's degree in business or computer science is required and an MBA is preferred. You must have a minimum of seven years experience in information systems (health care or insurance industry experience preferred) and a thorough understanding of strategic information systems planning or information engineering.

We have immediate opportunities for middle and senior level managers with expertise in the following areas:

- **Enterprise Modeling**
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- **Integrated Applications Planning**
- **Clinical Applications Research**
- **Development Methods and Procedures**
- **Systems Reverse Engineering**
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Company growth has also created exciting opportunities for **programmer analysts** who have 2+ years experience with one or more of the following: IBM 30XX, COBOL, OS/MVS JCL, IDMS, VSAM, CICS, DB2, ADS/O and Tandem. Our environment includes large on-line distributed systems - PC's, mini's and mainframes.

You will work at our corporate headquarters in Louisville - Kentucky's largest city. Besides being home to the Kentucky Derby, Louisville is known for its wonderful cultural and recreational opportunities, college athletics and low cost-of-living.

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5 years' experience in IDMS mainframe environment using ADSO and COBOL languages.

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2-3 years' technical experience including IDMS applications analysis and programming.

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SYSTEMS DESIGNER

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Thomson Consumer Electronics, manufacturer of RCA and GE brand consumer electronics products, has an immediate opportunity for an experienced EDI Systems Designer to assume a key leadership role in designing and implementing EDI systems.

Key responsibilities in this highly visible position will include analysis, mapping and programming of EDI transactions to/from applications, tranmission and communications problem resolution, EDI translator maintenance/modification, and interface with other internal information systems groups. Additional responsibilities will include periodic site visits to potential trading partners, VICS committee liaison work, participation in EDI seminars, and supervision of 1-2 programmer/analysts.

Qualifications must include a B.S. degree in Computer Science (or closely related field), familiarity with ANSIX.12 standards and IBM architecture, and demonstrated "mapping" experience. Strong interpersonal, presentation, and supervisory skills are also essential.

Thomson offers excellent salaries and benefits, plus exceptional opportunity for professional growth and recognition with a global leader in consumer electronics. Please send your resume, in confidence to **Professional Relations, M.S. 27-134-C, Thomson Consumer Electronics, P.O. Box 1976, Indianapolis, IN 46206-1976, or FAX your resume to us at (317) 231-4203.** An Equal Opportunity Employer.

RCA GE

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Senior Data Center Managers

National Locations

We are the Information Systems Division of the ARC Professional Services Group. We currently have outstanding opportunities for aggressive, experienced Data Center Managers (IBM) who are ready for the challenge of large system start-up sites throughout the U.S.A. Our environment will be IBM 3090 or equivalent running under MVS, VM and other IBM utilities. You should be knowledgeable of:

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Our ideal managers will have a minimum of 15 years' experience and be skilled in interviewing, hiring practices and customer presentations. They should be geographically flexible and above all, share an interest in the success of the organization, the customer and themselves. To apply for this unique opportunity, send a résumé in confidence to: **Jim Clark, Manager of Staffing, ARC Professional Services Group, 1375 Piccard Drive, Rockville, MD 20850.** An Equal Opportunity Employer M/F/H/V.

ARC Professional Services Group

UNIX SYSTEMS MANAGER

The Space Telescope Science Institute, an international center for research and astronomy will be responsible for the science operations and systems support of the Hubble Space Telescope. We are seeking a person experienced in UNIX systems management to work a growing network of SUN workstations.

The Institute will support the bulk of its scientific data analysis activities on SUN3 and SUN4 family workstations, with possible future expansion to a UNIX-based mini-super computer. STScI has a system of 60 SUN and DEC workstations with both LAN and WAN connections (TCP/IP, DECNET, X.25). We expect to acquire at least 20 additional workstations in the near future. We are looking for an individual with at least five years of experience in UNIX systems management, preferable with BSD 4.3 or SUN systems. The successful candidate will be skilled in all aspects of systems management, including installations and update, software installations, user account management, disk space allocations and management, system security, NFS, equipment procurement and maintenance and hardware installations. Systems Programming experience (device drivers, kernel modifications) or experience supporting/programming x-windows would be an asset. Experience with both LAN and WAN management is essential.

STScI, located on the Johns Hopkins University Campus, offers a stimulating work environment and an exceptional comprehensive benefits package that includes 24 paid vacation days plus 10 holidays per year. Qualified candidates are required to send a resume and salary requirements to:

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The Information Systems Department is the central MIS organization for Sandia National Laboratories. This department provides operating system support for an IBM 3090 Mainframe and IBM 43XX computers. Software products and activities supported include: the MVS operating system, associated IBM system products, and non-IBM system level software; development of an administrative network; and planning for new hardware and software. Examples of the software supported include MVS/XA, CICS, DB2, CSP, AS, VM, ACF/NCP, and VTAM.

Candidates must have experience with system level software and demonstrate the ability to communicate effectively with users and all levels of management. Due to the wide range and depth of activity involved, candidates must have demonstrated high academic achievement. A BS/MS degree from an accredited university with a concentration in a computer science related discipline is required.

If you are interested in this outstanding opportunity, please send resume to: Dan Brewer, Staff Recruiting and Employment Division 3531-18, Sandia National Laboratories, Albuquerque, NM 87185.

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SUNY Institute of Technology at Utica/Rome

Systems Programmer/Analyst for academic computing. RESPONSIBILITIES include supervision of UNIX system; software generation, maintenance, installation and updates to system; applications. QUALIFICATIONS: Bachelor's degree in Computer Science or related field, 3 years experience in programming, UNIX background, proficiency in "C" language and good communication skills are required. Experience in networking of various architectures is highly desirable. SALARY: Commensurate with training and experience.

Send letter of application and resume by November 30, 1989 to:

Anthony F. Panebianco
Director of Personnel/ Affirmative Action
SUNY Institute of Technology at Utica/Rome
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P.O. Box 3050
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Systems Development Group
Systems Programmer II

To join in building network-based services for a multithousand workstation environment. Existing projects include servers (name, authorization, authentication, file, print, and notification), X-window systems, tool kits, and user interface.

Requirements: Bachelor's degree or equivalent combination of education and experience preferred. Two to four years' experience in UNIX systems programming required as is familiarity with C, and BSD network facilities. **Job No. A89-163**

Operations
Systems Programmer III and Systems Programmer II

Primary activities include software installation, systems administration, file systems maintenance, and management of workstation servers and clients. Assuring effective service levels throughout the entire Athena system, Systems Programmer III will provide technical leadership for its systems programming team, and develop and implement technical plans.

Requirements: A Bachelor's degree or equivalent experience with excellent communications and interpersonal skills. Five or more years' experience in systems programming for Systems Programmer III **(Job No. A89-161)** and three or more years' experience for Systems Programmer II **(Job No. A89-162)** as well as proven ability in providing nonstop, reliable operations service. Knowledge of UNIX, distributed computing technologies and the X-windowing system as well as familiarity with university computing service environments a plus.

Visual Computing
Systems Programmer II

To act as consultant and maintain Visual Computing technologies for student, faculty and development users. Job supports an ongoing development project in the use of multimedia computing in educational applications. Responsibilities include maintenance, inventory, vendor contact, deployment, recommendation and exploration of technologies for the production of multimedia computing. Hardware support includes Digital and IBM workstations, real-time video processor boards, video disk players, presentation environment switchers, and an audio/visual production studio. Software support includes UNIX, NES, AFS, X and Motif windowing systems.

Requirements: Bachelor's degree or equivalent experience and two to four years' direct experience in computer operations. Excellent communications and interpersonal skills necessary. **Job No. A89-160**

Interested candidates should send two copies of both cover letter and resume referencing appropriate job number to: **Sally Hansen, MIT Personnel Office, Bldg. E19-239, 400 Main Street, Cambridge, MA 02139.**

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The preferred applicant will have:

- A Bachelor's degree in Computer Science or Related Field of study
- Five plus years Systems Development experience
- A thorough knowledge of Datacom/DB, Data Dictionary, IDEAL and Dataquery
- Strong communication and interpersonal skills

SENIOR SYSTEMS ANALYST
Auburndale, Florida

As a Senior Systems Analyst your major responsibilities will be to support a variety of software components and other program products in an IBM/AS400 environment for our Florida manufacturing group. This will include providing direct systems development support to all manufacturing and agricultural operations and working with all levels of plant and headquarters ISD management.

The preferred applicant will have:

- A Bachelor's degree in Computer Science or related field of study
- Five plus years of manufacturing, financial or agricultural systems development experience
- AS 400 or systems 38 experience with a thorough knowledge of COBOL, DOS, SDA, APPC, RPG III, CL and PC programming
- Strong communications and interpersonal skills

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Qualifications:

- College degree, preferable in Computer Science
- 10+ years of systems experience with expertise in most phases of applications technology.
- 5+ years expertise with design of on-line adjudication function of group insurance medical claim systems.
- 5+ years experience with large-scale system development efforts.
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The CIGNA companies offer competitive salaries and excellent benefits and elocation assistance. Make the most of your talent and experience...make your move to CIGNA Systems. For prompt confidential consideration, send your resume and salary history to: Jeff Rotatori, CIGNA Companies, N-86, Hartford, CT 06152.

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Successful candidate must possess a Bachelor of Science degree in Architecture, Engineering or Computer Science, along with 4 years of Computer Aided Design and Drafting (CADD) experience, including 2 years of CADD System Analysis experience. Proficiency with the UNIX operating system and macro-programming is required, as well as strong interpersonal and oral communications skills.

Successful candidate will assume responsibilities including: identifying and establishing new applications; and maintaining existing CADD system; developing tutorials and conducting training programs; initiating, developing, and evaluating relationships with CADD vendors and consultants; and establishing annual operating and capital budgets.

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The successful candidate will present a work history that includes systems management in a health care/insurance environment and demonstrated achievements in data processing. A working knowledge of COBOL, CICS and OS/JCL are required. SAS experience would be a plus. A BS degree in computer science or related field is required.
The Computer Company offers a competitive starting salary and comprehensive benefits package. For the right creative individual, this can be your opportunity to excel. For prompt consideration, send your resume and salary requirements in confidence to: Personnel, The Computer Co., 2330 Ararat Blvd., Hbg., PA 17110. EOE M/F.

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System Manager for Hewlett Packard 3000/925LX Main Frame Computer. Must be familiar with programming in basic, Hewlett Packard operating system, Quiz, and E.D.I. Experience with PCs using DOS, Lotus and D Base III a plus. Minimum 5 years experience. Send resume and salary requirements to:

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MANAGER

DATABASE MANAGEMENT

AIL Systems Inc. is a subsidiary of Eaton Corporation and a world leader in electronic defense systems. Our business strategy is to manage our resources and information systems so that we can experience optimum growth in the years to come. Come and join us as we pursue new systems development to support our leadership position in the defense industry.

Reporting to the Director of Information Technologies, you will supervise and control the flow of all computerized data and assure its availability to our Information Systems, Data Service Center, and user organizations.

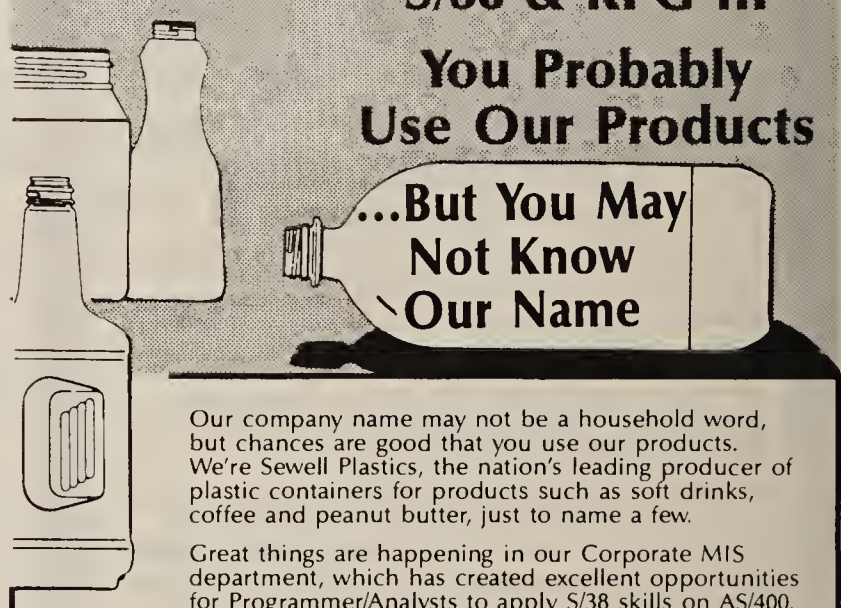
In addition, you will provide operational support to these groups, including recommending corrective actions to ensure the integrity of stored data in the event of a system failure. Your responsibilities will involve a high degree of technical expertise in developing database designs to meet AIL's information management objectives. Initially, this includes the establishment of all schemes and data dictionaries for technical, scientific, manufacturing planning engineering and financial organizations.

The successful candidate will have a Bachelor's degree in Computer Science and a minimum 5 years of related experience including knowledge of DoD requirements. He or she will also possess an in-depth understanding of computer capabilities and the potential application of new and developing database technologies. Strategic data planning experience is highly desirable along with excellent interpersonal skills required for managing and training analysis, programming and computer operations personnel.

If you have the above credentials, AIL Systems Inc. can offer you a rewarding and challenging career. We provide competitive salaries and attractive benefits. For immediate consideration, forward your resume with salary requirements to: Mr. Robert Cooper, Employment Administrator, AIL Systems Inc., a subsidiary of Eaton Corporation, Commack Road, Deer Park, NY 11729. We are an equal opportunity employer. We welcome response from minorities, females, veterans and the handicapped. U.S. citizenship required.

AIL SYSTEMS INC.

Programmer/Analysts
S/38 & RPG III



Our company name may not be a household word, but chances are good that you use our products. We're Sewell Plastics, the nation's leading producer of plastic containers for products such as soft drinks, coffee and peanut butter, just to name a few.

Great things are happening in our Corporate MIS department, which has created excellent opportunities for Programmer/Analysts to apply S/38 skills on AS/400, using RPG III. Heavy experience with financial/ accounting software desirable.

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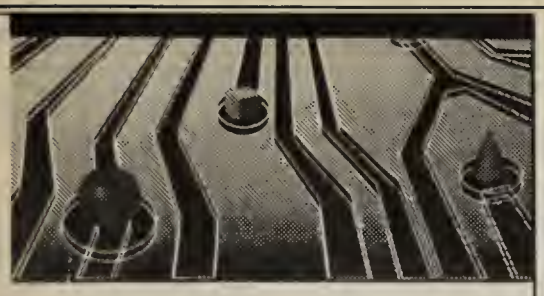

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The Boston Company offers competitive salaries, excellent benefits and exceptional opportunities for advancement. To apply, please forward your resume to The Boston Company, Human Resources, Attn: Maggie McCabe, One Boston Place, OB-11B, Boston MA 02108. An equal opportunity employer, M/F/H/V.

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SENIOR PROGRAMMER/ ANALYST

Alexandria Hospital is a 414-bed acute care facility serving the Northern Virginia metropolitan area for over 117 years. We invite you to explore our unique work environment and commitment to our employees. Our M.I.S. department is currently seeking an experienced professional to join their team.

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FAX (914) 698-5556

SR. PROGRAMMER/ANALYST

Banner Life Insurance, a dynamic and progressive organization, is currently seeking self-motivated individuals for positions within our data processing department. The positions are located in our Rockville, MD home office.

Ideal candidate will have minimum 5 years experience in MVS JCL, ALC/COBOL, Life-Comm experience helpful and excellent communication skills. Responsibilities will include enhancing Life-Comm and its satellite systems to support our growing base of insurance products.

If this sounds like the opportunity you are seeking, Banner Life would appreciate hearing from you. We offer a competitive salary and excellent benefit package. Please send your resume and salary requirements to:

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Rockville, MD 20850
EOE M/F

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The following skills and knowledge are highly desirable: Detailed knowledge of telephone company functional areas, i.e., customer billing and/or toll; working knowledge of data processing concepts; a college degree or equivalent work experience.

PROGRAMMERS, PROGRAMMER ANALYSTS & SYSTEMS ANALYSTS:

We need professionals in both life cycle and development environments. To qualify, you will need 2-10 years actual work experience in COBOL, TSO/ISPF in a batch or on-line IBM mainframe environment. Strong systems development and methodologies background is highly desirable, along with experience in CICS Command/Macro, IMS and DB2. A BS/BA in Computer Science or equivalent experience is preferred.

Along with superior working conditions in a leading edge environment, we offer an excellent compensation and benefits package including relocation assistance. For confidential consideration, please send resume with salary history to: **GTE Data Services, P.O. Box 290152, Dept. CBSS-CW, Temple Terrace, FL 33687-0152.** An Equal Opportunity Employer.

GTE Data Services

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If you think you would enjoy the challenge of consulting, have the requisite credentials, and are willing to make the commitment to excellence, we invite you to send your resume to: **Dick Clark, Ernst & Young, 1800 Peachtree Center South Tower, 225 Peachtree Street, N.E., Atlanta, GA 30303.** An Equal Opportunity Employer.

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IMS PROGRAMMER/ANALYSTS

3 or more years COBOL or PL/1 experience working in an IMS DB/DC environment is required for these positions. IBM JCL, TSO/ISPF and applications work in finance, transportation operations, inventory control, or scheduling is preferred with a degree in Computer Science or Business a plus. Positions in Winston-Salem and Washington, D.C.

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Join our team of professionals by forwarding your resume with salary history to: USAir Employment Services Dept. COMPWRLD, P.O. Box 15866, Arlington, VA 22215. EOE/M/F. PRINCIPALS ONLY.

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We are seeking experienced Project Leaders to plan, schedule, and control projects in the wholesale/distribution areas.

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- 8+ years relevant systems development experience
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COMPUTER SYSTEMS MANAGER
DICKINSON COLLEGE

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DICKINSON COLLEGE
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COMPUTER POSITION: SYSTEM PROGRAMMER

REQUIREMENT:

minimum 3 yrs. experience implementing, maintaining & customizing any of the following: **MVS/XA** products, **CICS, IDMS, VTAM or NETVIEW**

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We're seeking individuals capable of handling advanced and complex programming assignments while developing analysis and design skills. Assignments involve manufacturing, inventory, financial, payroll/personnel systems. A minimum of 2-4 years experience is required.

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EOE M/F

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Interbase

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Experienced Software Engineers

We are searching for innovative, highly motivated Engineers with experience in DBMS internals, communications, or distributed processing. These people will contribute to the future development of InterBase, the most advanced database system commercially available. We hire people who thrive on the challenge of writing high quality software for diverse environments, including systems for Apollo, DEC, HP, IBM, and SUN. Experience in designing and implementing operating systems, real time systems, or distributed systems is highly desirable.

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Our professional team of Support Engineers is looking for additional team players to assist in providing direct customer support, training and consulting to users of InterBase. You will also contribute to the company's Quality Assurance program and ensure the quality of the InterBase OSRI Interface. To support our pace setting technology, applicants must have a minimum of 5 years' experience supporting, programming or providing training on relational database products on VAX/VMS. We will also consider complex application or system programming experience in C, Fortran or Pascal in a Domain, UNIX or VAX/VMS environment. Experience with SQL-based relational DBMS as well as RDB/VMS and other VIA products highly desirable. Combine these requirements with your superior problem solving and communication skills and you are qualified to join our Technical Support Staff.

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CHIEF, DATA PROCESSING DIVISION

to be based at its Headquarters in Vienna. The division is organized into one Systems Development and one Operations Branch with a total of about 30 staff responsible for the development and maintenance of a variety of batch, on-line and office automation systems. At present the batch systems run on a large IBM mainframe operated by the International Atomic Energy Agency, while office automation and a limited number of on-line systems run on Wang equipment installed at UNRWA's Headquarters offices in Vienna and Amman and in its Field Offices in Lebanon, Syria, Jordan, the West Bank and Gaza. The Vienna Headquarters office has one VS7150 and one VS65 with a total of approximately 130 devices attached, including about 100 PCs. Each of the other six locations has a VS65 with 20-40 PCs, printers, etc.

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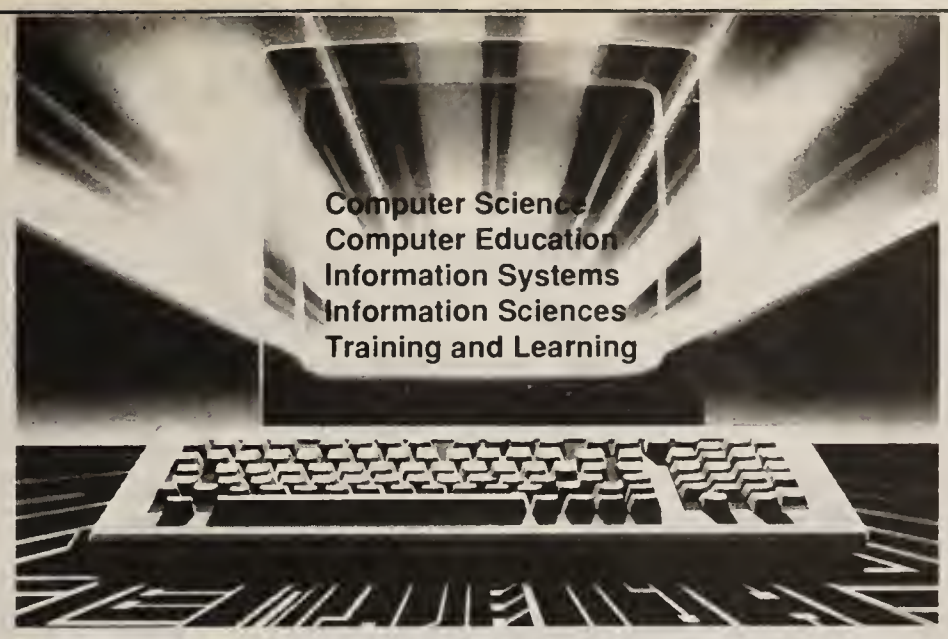

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MARKETPLACE

The path to a system purchase

Get help from other departments to wend your way to a complete contract

BY MICHAEL ERBSCHLOE
SPECIAL TO CW

Buying a computer system is not a simple process. Evaluating one involves not only assessing technical requirements but also weighing vendors' capabilities, the financing options and contractual requirements.

A system purchase will eventually involve several departments in your company. The purchasing, legal, risk management and financial offices will all play a role, and you should welcome their involvement. With their expertise, they can alleviate many of the management headaches that are inherent in the acquisition process.

Most buyers will follow one of two paths. The majority are committed to a single vendor and need only to select a system compatible with their architecture that meets the requirements for number of users, storage capacity and similar considerations. Other buyers can consider several vendors that can meet their requirements.

Commitment to one vendor simplifies a system purchase but still leaves much work in negotiating contracts. Reviewing several vendors calls for comparing contracts, which prolongs the evaluation and negotiation.

Regardless of the situation, the time for negotiating contract terms and conditions is before accepting a bid. You will lose considerable negotiating power if you award a contract before all the terms and conditions are agreed upon. Thus, it is important to review the contractual options offered by each vendor during the evaluation process.

Contract basics

System purchase contracts vary, but all of them should address the following points:

- The description and specifications of the system should be detailed. This is your opportunity to ensure that vendors understand exactly what you are buying. The contract should describe each piece of equipment, including optional features.
- The contract should include the total price as well as the costs of individual items. If you are eligible for any discounts, be sure the prices reflect them. The need for detail in this section cannot be overstated.
- Many systems have ongoing costs, such as software licensing fees. The contract should cover all immediate and future costs. It should detail the vendor's policy for fee increases and include the cost of upgrades for the operating system and other software.
- The contract also should specify maintenance requirements and costs. You should require a detailed breakdown of the services and their prices. This should include turnaround time on service calls and the vendor's responsibilities.
- The contract should specify warranties, including their duration, coverage and, again, turnaround time for service calls.

> REGARDLESS of the situation, the time for negotiating contract terms and conditions is before accepting a bid.

Installation can be a major expense. Your contract should specify who pays for what. Do not forget about cables, power supplies, cooling systems and phone lines for diagnostic modems.

The need for other environmental items, such as a raised computer room floor, should also be specified in the contract. The descriptions should be as detailed as possible and spell out which party bears responsibility and costs for each item.

If you already have a system, you will probably need to port or convert existing programs to the new one. If you expect the vendor to do such work, it must be stated in the contract. If your vendor guarantees portability, be sure to get the guarantee in the contract, along with descriptions of the vendor's liabilities for shortcomings.

The delivery date is very important. Get written commitments for it and be sure your computer center can be ready for delivery on that date.

Trade-ins and incentives

With competition among computer vendors on the rise, many of them have been offering incentives for buying or upgrading systems. They have offered attractive trade-in packages as well. If you are taking advantage of such offers, get that in the contract. This is especially true of trade-in allowances and special pricing for future upgrades. Be sure that the contract details other discounts that you are eligible for in the future, too.

A final note: You should spend time with representatives of the various departments in your company that will be involved in the acquisition before negotiating a contract. You should get their input on additional items to include. They might have encountered problems with a particular vendor in the past. They may also be able to educate you about negotiating strategies and things to look for in contracts.

You should always have your legal department or attorney review contracts before the final negotiations and the signing. There are several steps during the process for which your legal counsel may want to be present. Keep your attorneys informed of negotiations.

A detailed, well-negotiated contract can provide you with a computer system that will meet your company's needs and perhaps even cut its operating costs. An ambiguous, poorly negotiated contract, on the other hand, could increase costs and delay installation and conversion.

Erbschloe is executive editor at Computer Economics, Inc. in Carlsbad, Calif.

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	Closing price	Recent high	Recent low
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XT Model 089	$1,025	$1,400	$950
AT Model 099	$1,475	$1,850	$1,400
AT Model 239	$1,700	$2,100	$1,700
AT Model 339	$1,825	$2,000	$1,700
PS/2 Model 50	$1,525	$2,000	$1,500
PS/2 Model 60	$2,700	$3,300	$2,500
Compaq Portable I	$575	$750	$325
Portable II	$1,350	$1,700	$1,350
Portable III	$2,600	$2,800	$2,200
Portable 286	$1,600	$2,000	$1,600
Plus	$750	$1,200	$675
Deskpro 286	$2,025	$2,350	$1,700
Deskpro 386	$2,800	$2,900	$2,500
Apple Macintosh 512	$550	$650	$300
512E	$625	$925	$600
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MISSISSIPPI CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received by the CDPA, 301 N. Lamar St., 301 Building, Suite 508, Jackson, MS 39201 for the following equipment and services.

Request for Proposal No. 1668, due Thursday, November 9, 1989 at 3:30 p.m. for the acquisition of a local area network with 19 workstations for the UNIVERSITY OF SOUTHERN MISSISSIPPI.

Request for Proposal No. 1670, due Thursday, November 9, 1989 at 3:30 p.m. for the acquisition of a small MS-DOS based local area network with a 3270 gateway to the IBM mainframe at the State Computer Center for the MISSISSIPPI HOUSE OF REPRESENTATIVES.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

Patsy Stanley @ (601) 359-2604

The Financial Information Services, Agency, of the City of New York, is requesting that qualified vendors submit a proposal for (Direct Access Storage Devices). Copies of the RFP are available for all those interested. For further details, call Ms. Monique Ortiz at (212) 206-3111.

A pre-proposers conference is scheduled for Thursday, November 9, 1989 at 2 P.M. at 111 Eighth Avenue (13th Floor), New York, NY 10007.

The deadline for submission in response to this RFP will be Tuesday, November 21, 1989 at 5 P.M.

Further details regarding the conference, specifications and proposals submission may be found within the RFP.

STATE OF MAINE
DEPARTMENT OF PUBLIC SAFETY
REQUEST FOR PROPOSALS

The State of Maine DPS is seeking proposals from qualified vendors for the implementation of hardware designed to support data communications and application systems; development of applications software to support various operating units of the organization; conversion of existing application portfolios; integration of information technology components into a cognet solution; and, project management service.

Copies of the proposal including specifications of work to be performed may be obtained from: Richard C. Gribbin, Department of Public Safety, 36 Hospital Street, Augusta, ME 04333. (207) 289-3396.

A proposers conference is sheduled for 9:30 am on Thursday 11/16/89 in room 113 State OfficeBuilding, Augusta, ME 04333. Proposals must be received by 2:00 pm on 1/5/90.

The Financial Information Services, Agency, of the City of New York, is requesting that qualified vendors submit a proposal for a Large Mainframe Processor. Copies of the RFP are available for all those interested. For further details, call Ms. Monique Ortiz at (212) 206-3111.

A pre-proposers conference is scheduled for Thursday, November 9, 1989 at 2 P.M. at 111 Eighth Avenue (13th Floor), New York, NY 10007.

The deadline for submission in response to this RFP will be Tuesday, November 21, 1989 at 5 P.M.

Further details regarding the conference, specifications and proposals submission may be found within the RFP.

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Who will you call on for help?

Options include brokers and vendors, whose expertise often goes unused

BY MARK DUNCAN
SPECIAL TO CW

At any point in time, somewhere in an information systems organization, a training manager stops dead in his tracks, raises up his hands, and shouts "Help!" He may be the novice who has just realized what he has taken on; he may be a veteran perplexed at the failure of problem-solving measures that worked well in the past; or he may be the typical manager fighting a losing battle for sufficient resources to do his job properly.

At such times, it can be appropriate to enlist the help of training consultants. Such consultants come in a variety of shapes and sizes and can supply as much or as little assistance as necessary. They range from sole practitioners to sizable divisions of Fortune 500 corporations.

A consultant can bring objectivity and accumulated experience to this type of situation. He may recognize symptoms in a failing training function that he has diagnosed and remedied before. A training manager, for example, is apt to blame failure simply on student disinterest or a teacher's lack of skills. A consultant may offer a more penetrating analysis; he may identify such causes as inappropriate training media, courses that are too difficult or too easy for the audience in question or instruction that is not pertinent to people's jobs.

Not only can consultants provide an objective point of view, but they can also mobilize resources that may be unavailable to the average training manager. For example, a consultant might be better prepared to conduct an analysis of training needs; the rate of change of technology today requires more frequent needs analyses to keep curricula current.

Unexpected methods

Finally, training consultants can offer particularly creative solutions to problems. A computer timesharing and consulting company, for example, was suffering from excessive antipathy between salespeople and the technical support staff. The problem was resolved only after a training consultant suggested that the salespeople attend a technical training class and the technical staff join a sales class. The salespeople and technical workers acquired a greater appreciation for each others' activities, making them happier and less likely to jeopardize business success.

Some vendors of training materials and services are ready to respond to the training manager's distress with consulting services. Naturally, these organizations are interested in selling their products and services; even vendors requiring prepaid contracts are anxious for credits to be spent. But by providing services, such as a customized needs analysis, vendors can save training managers some legwork. The reputable training companies are not interested in taking the customer's money and running; they wield consulting services as tools to help cement long-term relationships.

Over time, training managers become accustomed to using vendors in specific ways for conventional needs. However, the manager who needs extra help should investigate whether additional services such as needs analysis are available to him as a customer, or ask about different ways of getting things done. When tapped effectively, training vendors can help realize extraordinary results.

Some independent practitioners offer both consulting and training services, emphasizing flexibility that may be harder to come by in dealing with a large company. One consultant I know who specializes in project management will lead a project for a client as a consultant while training one of the client's employees to succeed her in that role.

> THE MANAGER who needs extra help should investigate whether additional services such as needs analysis are available to him as a customer.

Another relatively small consulting firm emphasizes the value of "one-stop training," under which a manager can deal with one person, whether to describe training needs or discuss billing for services.

An additional option for the manager is a training broker, who acts as an intermediary between the client and vendors, allowing the client to choose among a number of vendors. If, for example, an IS manager wanted to provide training in Cobol II, a broker could research and negotiate arrangements with several training companies, check references and allow the client to make the final choice. The search could be based on specific client needs, such as timing, budget or customization.

The brokers' services sometimes extend to course auditing, whereby the broker attends part of a course to evaluate it or determine whether an instructor is acceptable for a client.

Brokers might offer these services at no charge to the client, and some arrange for training at reduced rates. One firm claims it can cut training costs by 20% to 30% while responding quickly to unplanned demands from clients. The firm maintains surveillance over available training so an individual in need of instruction in DB2, for example, can be enrolled in a class that is about to begin.

Even if training managers don't call out for help, they can get frustrated. When old solutions do not work, fresh approaches are required, and the manager may be too close to the situation to supply them.

Duncan is a quality assurance consultant at a large Dallas bank.

COMPUTERWORLD's

November

Training Editorial Topics

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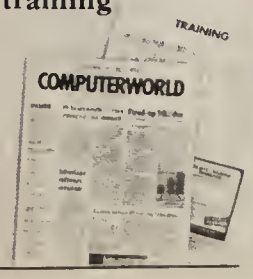

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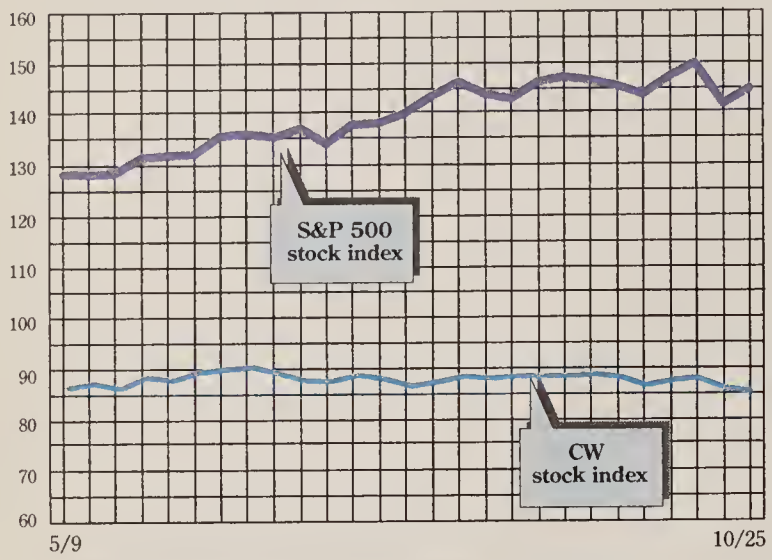
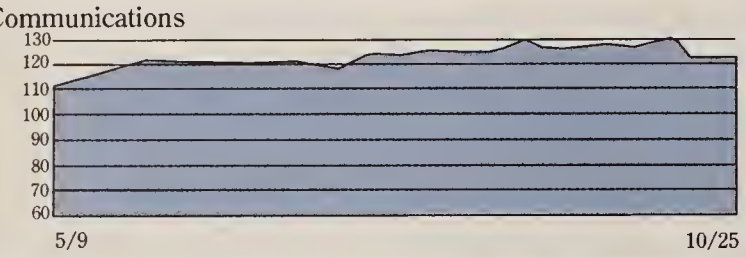
STOCK TRADING INDEX

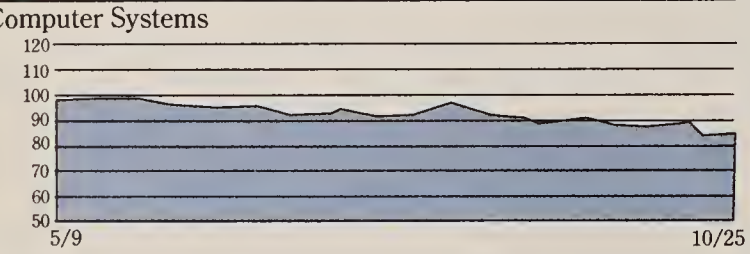


Indexes	*Last Week*	*This Week*
Communications	123.4	**123.4**
Computer Systems	85.2	**85.5**
Software & DP Services	113.5	**114.4**
Semiconductors	53.3	**51.4**
Peripherals & Subsystems	77.1	**78.1**
Leasing Companies	107.7	**104.4**
Composite Index	86.4	**85.8**
S&P 500 Index	143.9	**145.0**

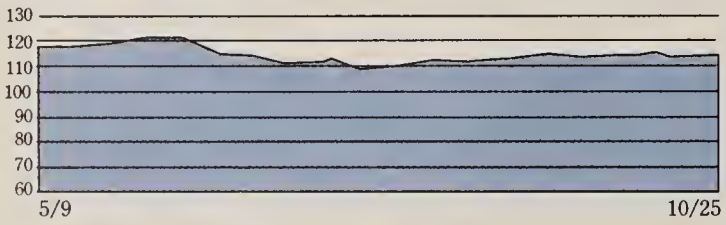
Communications



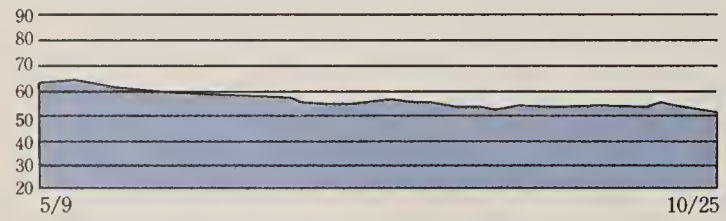
Computer Systems



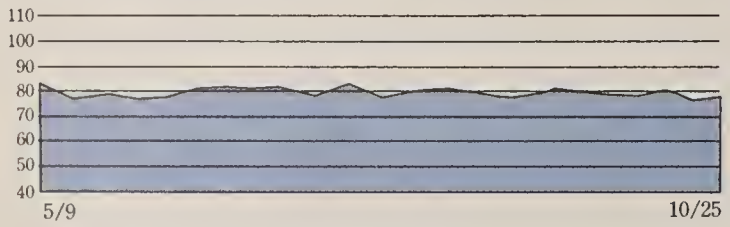
Software & DP Services



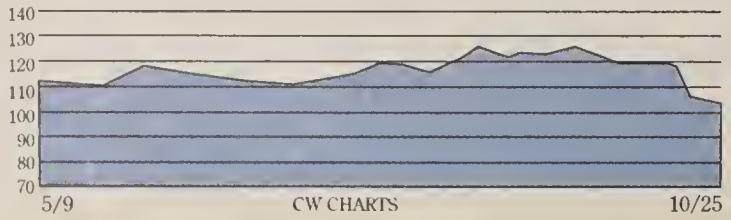
Semiconductors



Peripherals & Subsystems



Leasing Companies



Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, OCT. 25, 1989

EXCH		52-WEEK RANGE		PRICE CLOSE OCT. 25, 1989	WEEK NET CHNGE	WEEK PCT CHNGE
Communications and Network Services						
N	AMERICAN INFO TECHS CORP	65	46	63.125	0.4	0.6
Q	ANOREW CORP	26	16	23.75	0.3	1.1
Q	ARTEL COMM CORP	9	2	6.25	-0.4	-5.7
N	AT&T	46	27	43.5	1.0	2.4
Q	AVANTEK INC	7	4	4.75	-0.3	-5.0
N	AYOIN CORP	21	13	19.625	0.4	1.9
N	8ELL ATLANTIC CORP	105	69	100.875	1.8	1.8
N	8ELLSOUTH CORP	55	39	53.375	0.4	0.7
Q	COMPRESSION LABS INC	11	3	9.125	-0.6	-6.4
Q	COMPUTER NETWORK TECH	3	1	2.469	0.3	12.8
Q	CONTEL CORP	37	18	33.25	0.8	2.3
Q	OATA SWITCH CORP	6	2	2.25	0.0	0.0
Q	OIGITAL COMM ASSOC	26	17	18.375	-0.6	-3.3
Q	OYNATECH CORP	21	17	17.875	-0.4	-2.1
Q	FI8RONICS INTNL INC	7	3	6.125	0.1	2.1
Q	GANDALF TECHNOLOGIES	7	4	5.875	-0.1	-2.1
N	GENERAL DATACOMM INOS	7	4	5	-0.5	-9.1
N	GTE CORP	67	42	62.875	-2.5	-3.8
Q	INFOTRON SYS CORP	13	9	9.25	0.3	2.8
N	ITT CORP	65	48	58.375	-0.6	-1.1
N	M A COM INC	10	6	6.125	-0.1	-2.0
Q	MCI COMMUNICATIONS CORP	49	20	43	-0.6	-1.4
N	NETWORK EQUIP TECH INC	28	14	26.75	0.3	0.9
Q	NETWORK SYS CORP	11	8	8	-0.1	-1.5
N	NORTHERN TELECOM LTO	23	14	22.5	-0.3	-1.1
Q	NOVELL INC	38	24	29.5	-0.4	-1.3
N	NYNEX CORP	84	65	78.875	-0.6	-0.8
N	PACIFIC TELESIS GROUP	47	29	44.625	0.0	0.0
A	PENRIL CORP	9	3	7.875	0.8	10.5
N	PLESSEY PLC	46	29	39.75	-0.4	-0.9
N	SCIENTIFIC ATLANTA INC	24	11	21.875	0.8	3.6
N	SOUTHWESTERN 8ELL CORP	59	39	57.5	1.6	2.9
Q	3 COM CORP	29	12	12.75	0.1	1.0
N	U S WEST INC	75	55	69.875	-0.6	-0.9
Computer Systems						
Q	ALLIANT COMPUTER SYS	7	3	6.375	-0.1	-1.9
Q	ALPHA MICROSYSTEMS	8	5	5	-0.1	-2.4
Q	ALTOS COMPUTER SYS	9	6	7.875	0.9	12.5
A	AMOAHL CORP	23	12	12.375	-0.1	-1.0
Q	APPLE COMPUTER INC	50	34	46.5	-1.8	-3.6
N	80LT 8ERANEK & NEWMAN	14	7	7.5	0.4	5.3
N	COMPAQ COMPUTER CORP	113	52	108.625	2.1	2.0
N	COMMODORE INTERNATIONAL	20	7	7.625	-1.3	-14.1
Q	COMPUTER AUTOMATION INC	7	3	2.875	0.4	15.0
N	CONTROL OATA CORP	24	16	18.75	-0.1	-0.7
Q	CONVEX COMPUTER CORP	16	9	15.75	0.6	4.1
N	CRAY RESH INC	66	33	34.125	-1.3	-3.5
Q	DAISY SYS CORP	8	1	1.5	-0.1	-7.7
N	DATA GEN CORP	20	14	14.125	0.4	2.7
N	OATAPOINT CORP	6	3	5.375	0.1	2.4
Q	OELL COMPUTER CORP	13	6	6.5	-0.4	-5.5
N	OIGITAL EQUIP CORP	122	85	90.25	1.9	2.1
N	FLOATING POINT SYS INC	4	1	1.875	0.4	25.0
N	HARRIS CORP	40	25	37.625	0.4	1.0
N	HEWLETT PACKARO CO	62	46	50.5	1.5	3.1
N	HONEYWELL INC	92	57	83	4.4	5.6
N	I8M	131	98	101.875	0.1	0.1
Q	INFORMATION INTNL INC	16	12	12.25	-0.4	-3.0
Q	IPL SYS INC	9	4	7.25	-0.1	-1.7
N	MAI 8ASIC FOUR INC	14	3	4.25	0.0	0.0
N	MATSUSHITA ELEC INOL LTD	204	158	164.25	-0.3	-0.2
Q	MENTOR GRAPHICS CORP	22	12	16.375	-2.3	-12.1
N	N8I INC	3	1	1.125	-0.1	-10.0
N	NCR CORP	67	51	58.75	1.8	3.1
N	PRIME COMPUTER INC	21	8	8.125	-1.0	-11.0
Q	PYRAMIO TECHNOLOGY	20	9	16.75	2.3	15.5
Q	SEQUENT COMP SYS INC	38	16	34.75	-0.8	-2.1
Q	SHAREBASE CORP	4	0	0.563	-0.4	-40.0
Q	SILICON GRAPHICS CORP	27	14	25.75	2.5	10.8
Q	STRATUS COMPUTER	35	21	22.75	0.0	0.0
Q	SUN MICROSYSTEM INC	23	13	17.75	0.5	2.9
Q	SYM8OLICS INC	3	1	1.813	0.4	26.1
N	TANOEM COMPUTERS INC	26	14	25.875	1.3	5.1
N	TANOY CORP	49	38	44	-1.4	-3.0
N	ULTIMATE CORP	12	7	8.375	-0.1	-1.5
N	UNISYS CORP	31	18	17.5	-0.4	-2.1
A	WANG LABS INC	11	5	5.625	-0.1	-2.2
Software & DP Services						
Q	A008E SYS INC	30	14	16.75	-0.3	-1.5
Q	AMERICAN MGMT SYS INC	19	11	13.75	0.0	0.0
Q	AMERICAN SOFTWARE INC	22	9	22	1.9	9.3
N	ANACOMP INC	10	4	4	-0.6	-13.5
Q	ANALYSTS INTL CORP	20	8	18.25	-0.3	-1.4
Q	ASHTON TATE	27	9	11.25	0.9	8.4
Q	ASK COMPUTER SYS INC	18	7	8.25	0.1	1.5
N	AUTO OATA PROCESSING	51	36	48.75	1.8	3.7
Q	AUTOOESK INC	44	23	39.75	-1.0	-2.5
Q	8MC SOFTWARE INC	28	9	27	0.3	0.9
Q	8OOLE & 8A88AGE INC	20	9	14.5	-0.1	-0.9
N	8USINESSLAND INC	15	10	10	-0.8	-7.0
Q	COGNOS INC	9	5	4.875	-0.2	-3.7
N	COMPUTER ASSOC INTL INC	22	13	12.875	-1.6	-11.2
Q	COMPUTER HORIZONS CORP	11	7	9.125	-0.1	-1.4
N	COMPUTER SCIENCES CORP	56	44	50.25	0.9	1.8
N	COMPUTER TASK GROUP INC	16	10	11.25	1.3	12.5
Q	COMSHARE INC	42	19	35.25	0.0	0.0
Q	CORPORATE SOFTWARE	16	9	10	1.0	11.1
N	GENERAL MTRS (CLS E)	56	39	52.25	-0.9	-1.6
Q	HOGAN SYS INC	7	4	5.25	0.0	0.0
Q	INFORMIX CORP	14	7	13.625	3.4	32.9
Q	INTELLICORP INC	6	3	5.25	0.1	2.4
Q	LEGENT CORP	32	18	28.625	-1.4	-4.6
Q	LOTUS DEV CORP	34	17	32.25	-0.3	-0.8
Q	MANAGEMENT SCI AMER	12	6	10.625	0.5	4.9
Q	MICROSOFT CORP	86	22	79.75	-0.8	-0.9
Q	NATIONAL DATA CORP	35	19	31	-0.6	-2.0
N	ON LINE SOFTWARE INTL INC	8	5	8.125	0.3	3.2
Q	ORACLE SYS CORP	26	7	25.625	0.6	2.5
N	PANSOPHIC SYS INC	18	12	13.5	0.0	0.0
Q	PHOENIX TECHNOLOGIES INC	19	3	3.25	-0.1	-3.7
Q	POLICY MGMT SYS CORP	37	22	33.125	1.1	3.5
Q	PROGRAMMING & SYS INC	21	14	20.25	0.3	1.3
Q	RELATIONAL TECHNOLOGY INC	16	5	5.75	-0.3	-4.2
N	REYNOLOS & REYNOLOS CO	34	20	24.875	0.1	0.5
Q	SAGE SOFTWARE INC	10	6	9.5	0.7	7.8
Q	SEI CORP	20	16	18.5	0.0	0.0
Q	SHARED MEO SYS CORP	19	14	14.25	-0.8	-5.0
Q	SOFTWARE PU8G CORP	31	16	26.5	-2.3	-7.8
A	STERLING SOFTWARE INC	9	5	7.5	0.5	7.1
Q	SUNGARO DATA SYS INC	22	13	20.875	-0.4	-1.8
Q	SYSTEMATICS INC	40	26	36.75	0.4	1.0
N	SYSTEM CENTER INC	26	14	20.75	-1.1	-5.1
N	SYS. SOFT INC	30	13	27.25	0.8	2.8
Q	WORDSTAR	3	2	1.563	-0.1	-3.8
Semiconductors						
N	AOV MICRO OEVICES INC	11	7	8.125	-0.3	-3.0
N	ANALOG OEVICES INC	13	9	8.625	-0.6	-6.8
Q	ANALOGIC CORP	11	7	9.625	-0.6	-6.1
Q	CHIPS & TECHNOLOGIES INC	26	11	22.25	-1.8	-7.3
Q	INTEL CORP	35	19	32.875	-1.0	-3.0
Q	MICRON TECHNOLOGY INC	26	11	11.25	-0.5	-4.3
N	MOTOROLA INC	63	36	55.875	-1.0	-1.8
N	NATL SEMICONOUCTOR	10	7	7.625	0.0	0.0
N	TEXAS INSTRS INC	47	32	32.5	-2.6	-7.5
A	WESTERN DIGITAL CORP	15	6	7.375	0.0	0.0
Peripherals						
Q	ALLOY COMP	3	1	1.75	-0.1	-6.7
N	AM INTL INC	6	5	5	0.0	0.0
Q	AST RESH INC	11	7	11	2.3	25.7
Q	AUTO TROL TECH CORP	6	4	3.75	0.0	0.0
Q	8ANCTEC INC	20	9	14.5	-2.3	-13.4
Q	CIPHER DATA PROOS INC	11	4	4.75	-0.9	-15.6
A	COGNITRONICS CORP	8	2	7	0.5	7.7
Q	CONNOR PERIPHERALS	16	7	14.875	0.4	2.6
A	DATAPROOUCTS CORP	18	8	9.125	-0.3	-2.7
A	DATARAM CORP	12	7	8.875	0.0	0.0
N	EASTMAN KODAK CO	52	42	44.5	0.1	0.3
N	E M C CORP MASS	6	3	3.5	0.1	3.7
Q	EMULEX CORP	12	5	6.625	0.3	3.9
Q	EVANS & SUTHERLANO	25	14	21.5	0.0	0.0
Q	ICOT CORP	3	1	1.375	0.0	0.0
Q	INTERLEAF INC	10	6	6.25	-0.1	-2.0
Q	IOMEGA CORP	5	2	3.438	-0.1	-1.8
Q	LEE DATA CORP	4	1	1.375	-0.3	-15.4
Q	MASSTOR SYS CORP	4	2	2.75	-0.1	-2.2
Q	MAXTOR CORP	12	7	10	0.0	0.0
Q	MICROPOLIS CORP	9	3	3.875	0.0	0.0
Q	MINISCRI8E CORP	9	1	2.219	0.8	61.4
N	MINNESOTA MNG & MFG CO	80	59	72.625	0.6	0.9
Q	PERSONAL COMP PROOUCTS INC	6	4	4.125	0.0	0.0
Q	PRIAM CORP	2	0	0.375	0.1	19.8
Q	PRINTRONIX INC	10	7	9.625	0.9	10.0
N	QMS INC	12	6	11	0.1	1.1
Q	QUANTUM CORP	17	4	12.5	-2.0	-13.8
N	RECOGNITION EQUIP INC	13	6	6.875	-0.3	-3.5
Q	REXON INC	8	6	6.25	-0.1	-2.0
Q	SEAGATE TECHNOLOGY	16	7	13	-1.0	-7.1
N	STORAGE TECH CORP	23	9	13.25	0.4	2.9
Q	TANOON CORP	2	0	1.125	-0.1	-5.3
N	TEKTRONIX INC	24	17	18.5	-0.4	-2.0
Q	TELEVIOEO SYS INC	1	0	0.438	0.0	0.0
N	XEROX CORP	69	54	59.625	-2.9	-4.6
Leasing Companies						
Q	AMPLICON INC	115	11	12	-0.4	-3.0
N	CAPITAL ASSOC INTNL INC	9	4	4.75	-0.3	-5.0
N	COMOISCO INC	34	19	30.875	1.1	3.8
Q	CONTINENTAL INFO SYS	4	0	0.344	-0.1	-15.3
Q	LOI CORPORATION	18	12	17.75	0.3	1.4
Q	PHOENIX AMERN INC	5	3	3.875	0.0	0.0
Q	SELECTERM INC	9	5	7	-0.3	-3.4

EXCH:N = NEW YORK;A = AMERICAN;Q = NATIONAL

Hard ball

Investors take their lumps as firms play hard to get

The World Series resumed at the end of last week, as did the not-so-glowing earnings reports from technology firms. Investors struck out, with Compaq Computer Corp. and Microsoft Corp. at the top of the lineup. Compaq lobbed up a good-looking pitch, announcing a 51% increase in third-quarter profits, but that was lower than analysts had expected. Compaq closed Thursday at 100, down a sharp 9⅞ points. Microsoft, which hit a high point two weeks ago, fell prey to profit takers, dropping 7½ points to close at 77¾.

Also suffering a down week were Unisys Corp., Tandy Corp., Apple Computer, Inc. and Sun Microsystems, Inc. Unisys reported a $600 million loss for its third quarter (see story page 1); its shares closed at 17, down 1¼ points. Tandy announced it would not be joining U.S. Memories, Inc., the chip consortium formed to compete with overseas semiconductor firms. Tandy fell 2 points to close at 43⅜. Apple's final-quarter earnings were not up as high as analysts had hoped; it slipped 2¾ to finish at 45¼. Despite a glowing first-quarter earnings report, Sun's shares closed at 17⅛, off 1½ points.

Digital Equipment Corp. and IBM faltered along with other high-tech issues. DEC fell 1½ points to close at 88, and IBM dropped 3½ points to finish at 100¾. Motorola, Inc. and Intel Corp. also slumped. Motorola slid 3⅜ points to close at 55¼; Intel dropped 2¾ points to end at 32.

JOSEPH J. FATTON

Defense

FROM PAGE 1

Management, could lead to the consolidation of the multiple accounting, payroll, inventory and personnel systems run by each of the military services.

For example, the U.S. Army, Air Force, Navy, Marines and the Defense Logistics Agency each has developed its own warehouse information systems, according to William J. Sharkey Jr., head of production and logistics systems.

"This management initiative is going to be accompanied by some kind of budget whammy, as well," Sharkey predicted.

Speaking at last week's Federal Computer Conference, Sharkey said DOD program managers must give high priority to improving IS management at a time when DOD's budget is being cut and the Bush administration is instituting management reforms.

In an Oct. 4 memo, Atwood said that "there appears to be a need to improve the standardization, quality and consistency of data from DOD's multiple management information systems."

DOD should stop developing and maintaining multiple systems to meet the same functional requirements, Atwood said. Atwood called for the following actions to implement the Corporate Information Management program over a generally unspecified time frame:

- An executive-level advisory group of IS experts from inside and outside DOD will be formed to recommend corrective actions.
- The information resources management staff — part of the DOD comptroller's office — will draft a management plan for the program.
- DOD experts in each functional area, such as warehousing or payroll, will begin this week to form "function groups" to study compatibility and redundancy issues and develop standard data formats.

Discovery of 486 bugs may slow initial PC shipments

BY RICHARD PASTORE
CW STAFF

Intel Corp.'s 80486 chip, the breakneck engine powering upcoming high-profile personal computers from several manufacturers, has a couple of screws loose.

Intel disclosed last week that two flaws were found in the chip's floating point processor. The bugs can cause machines to falter on tangent, cosine and sine calculations, which would primarily affect computer-aided design and scientific applications rather than business applications.

An Intel spokeswoman said the company will begin developing a revised chip this week, and it will be late November before quantity shipments are available.

Meanwhile, some vendors said the flaws will not affect their 486 rollouts.

No bug encounters

An IBM spokesman said that no users of its 486 plug-in card for Personal System/2s has reported encounters with the bugs. However, the company has temporarily halted shipments while it evaluates the problem. It has no plans to recall the product, he said.

A spokesman at Compaq Computer Corp. said Compaq discovered the flaws while testing its 486-based machines, which were poised for launching on Nov. 6.

The spokesman said Compaq will still announce on schedule, but the shipment of product will depend on when Intel delivers the corrected chips.

"We were going to be shipping that day," the spokesman said, "but we don't want to let [machines with] flawed chips out the door."

NSF cuts supercomputer grant

BY ELLIS BOOKER
CW STAFF

PRINCETON, N.J. — The Consortium for Scientific Computing knew it was betting on a dark horse in 1984 when it selected ETA Systems, Inc. as the supercomputer vendor for its John von Neumann National Supercomputer Center (JVNC).

The bet was lost two weeks ago when the National Science Foundation (NSF) said it would not renew its five-year grant to the JVNC, which ends next April. Meanwhile, the NSF has renewed funding requests from the four other supercomputer centers it funds, none of which used ETA equipment.

ETA Systems parent Control Data Corp. abruptly folded its money-losing subsidiary and left JVNC with two of the world's seven liquid nitrogen-cooled ETA10 supercomputers.

The Consortium, which is made up of 13 participating universities, quickly redrafted its supercomputer program and in June proposed replacing the larger ETA10 with an eight-processor Y-MP supercomputer from Cray Research, Inc. in Minneapolis. That proposal was rejected this month, although the group said it will ask the NSF to reconsider.

Consortium members reacted strongly to the withdrawal of support. Under its cooperative agreement with the NSF, the center's funding for fiscal year 1990 is $15.4 million.

"I disagree strongly with that view [that] the NSF program centers are just four walls and a roof to keep the rain off a machine," said Doyle Knight, president of the consortium. Knight described the JVNC as a "national resource" and said that its education and training program — some 1,500 users have been trained in the past 3½ years — illustrates its value.

"In retrospect, the decision to fund JVNC in 1984 with an ETA [system] was the right decision," said Thomas Weber, division director of advanced scientific computing at NSF in Washington, D.C. However, he continued, "Everyone realized how risky it was . . . It was a paper machine that looked good in 1984."

More access

Weber said academic researchers now have substantially more access to supercomputers than in 1984. "We count 30 state and local centers that have supercomputers," he said. Since 1984 there has been an 80% increase in the computer cycles available to academic researchers, and the expected systemwide capacity of the four remaining centers will be twice what it was with five centers, Weber said.

However, Knight challenged this assessment of the nation's supercomputing capacity. He noted that NSF's own peer review panel had recommended that the five-year JVNC grant be renewed.

All but one of the four remaining NSF-backed supercomputer facilities uses Cray equipment: Cornell University has two IBM 3090 600s equipped with IBM's Vector Facility, which is loosely coupled in parallel so that researchers can use all 12 processors at once.

Steering grantees?

Does the decision on JVNC mean that NSF plans to steer its supercomputer grantees away from certain vendors, even ones with promising technology?

"We have no policy, no stated policy. They can propose whatever they want," Weber said. However, he confirmed that supercomputers from Japanese vendors have not appeared in grants coming into the NSF.

"Remember," Weber said, "the original goal was to stimulate the U.S. [supercomputer] industry," and it was therefore "consistent" to go with ETA Systems five years ago.

The JVNC's grant from the NSF expires on April 30, 1990. The center has been given a six-month extension of the grant so that it can make an orderly phase-down of its operation, according to the NSF.

FCC launches broad review of AT&T

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Alfred C. Sikes, chairman of the Federal Communications Commission, ordered a broad review of competition in the long-distance market last week to determine if AT&T operations should be further deregulated.

Sikes told the FCC's Common Carrier Bureau to have a regulatory proposal ready by the end of the year. In essence, the proceeding will determine whether AT&T should continue to be classified as a "dominant" long-haul carrier whose tariffs — such as Tariff 12 for large custom networks — must be heavily regulated.

In a separate action, the FCC upheld the legality of Tariff 12, although AT&T's competitors said they will continue to fight it in the courts.

George R. Dellinger, telecommunications analyst for Washington Analysis Corp., predicted that "AT&T will be found nondominant and will be provided a much greater degree of competitive lattitude in 1991." If AT&T were found to be no longer dominant, it would receive the relatively lax regulation now accorded MCI Communications Corp. and U.S. Sprint Communications Co. For example, it could provide new services in about two weeks, Dellinger said.

Many business users support the idea of a review of the long-distance market, but they are not unanimous about the merits of AT&T deregulation. Some are wary of giving AT&T more flexibility than it already has under the "price caps" regulatory regime [CW, Sept. 25], while others have complained about AT&T's regulatory shackles.

Georgia-Pacific Corp. in Atlanta recently switched from AT&T to MCI after criticizing service delays caused by the lengthy tariff approval process for AT&T. Paul Pavloff, Georgia-Pacific's senior director of information resources, said in a letter to the FCC that "artificial limitations which exist in today's marketplace should be abolished so all carriers are equally free to compete."

In a recent speech, Sikes said the reappraisal is necessary because AT&T "has been relinquishing market share by about 3.3% on average for the last five years," business markets are fiercely competitive and the regulatory process is being exploited by AT&T's competitors.

The three other members of the commission welcomed the broad proceeding, after expressing frustration with trying to address such major policy issues in the context of tariff investigations.

Tariff scrutiny

FCC Chairman Alfred C. Sikes announced the regulatory review in the midst of commission deliberations over Tariffs 12 and 15, which AT&T has used to counter competition from MCI and other carriers.

The FCC decided to reaffirm its April decision allowing Tariff 12 to remain in effect as long as the network services are made available to multiple customers [CW, April 17]. The ruling threw out objections filed by the Independent Data Communications Manufacturers Association and Williams Telecommunications Group, Inc.

The FCC warned AT&T and its business customers that the commission will closely examine Tariff 12 offerings "to ensure they do not disguise unreasonably discriminatory offerings."

In addition, the FCC ruled that AT&T must discontinue its Holiday Rate Plan, which provides telephone service to Holiday Corp.'s hotel chain at discounts of up to 10%. The FCC did not ban Tariff 15 competitive pricing plans but said that the single-customer discount for Holiday no longer merits an exemption from the federal policy against discriminatory services.

MITCH BETTS

DEC rewrites mainframe role

BY MARYFRAN JOHNSON
CW STAFF

BOSTON — The witching hour for Digital Equipment Corp. arrived a week before Halloween, as the company that made its fortune selling midsize machines rolled out five new models of the mainframe VAX 9000.

The treats tumbling out of the big-iron VAX were souped-up CPU speed, greatly expanded I/O throughputs and bandwidth and mainframe-capacity memory that hits 512M bytes.

The trick will be training a sales force schooled in minis on how to sell mainframes.

No problem, said Ken Olsen, DEC's president. "We've been making machines that size from the first part of Digital," he said. "Today, the definition of a mainframe is changing from batch processing to on-line transaction processing."

The machine will not begin shipping in volume until spring 1990, when the entry-level VAX 9000 Model 210 is due. It will be at least another year before the top-of-the-line Model 430s and 440s are available.

DEC also introduced a host of associated products (see story at right), including a long-awaited vector processor for VAX 6000s as well as the 9000.

The announcement also heralds DEC's entry into the supercomputing market, Olsen said. Once its vector processor is added, the new machine will meet federal government supercomputer specifications.

DEC is positioning its mainframe to fill a widening space in multivendor, distributed environments — especially in newer application areas where IBM has not had a chance to be dominant.

"The 9000 is not only going to sell well in the accounts running out of gas, but it will help DEC sell more VAXs," said John McCarthy, an analyst at Forrester Research, Inc. in Cambridge, Mass. "This gives their technology a shot in the arm, and that will reflect well in competitive bids with IBM and Hewlett-Packard."

DEC claimed its low-end Model 210 is roughly comparable in performance capabilities to the IBM 3090 Model 180S — although it is supposed to cost about half of what the IBM machine sells for.

Yet, the most important issue for an installed base of 15,000 high-end VAX systems is the fully compatible architecture of the 9000, which will run any and all of the 6,500 existing VMS applications.

The most radical change in the VAX architecture is the addition of the System Control Unit (SCU), a crossbar switching device that sits at the heart of the machine and acts as a high-speed (2G byte/sec.) conductor for data flowing between the CPU, memory and I/O controllers.

"The SCU is completely transparent to the users," said Peter Ross, product manager for the 9000. "The programmer doesn't have to write any instructions to deal with it."

While general press coverage has tended to pit the new VAX as a direct competitor to IBM's 3090, Bob Djurdjevic, president of Annex Research in Phoenix, said, "What they're trying to do with this is protect their own installed base."

Users of earlier VAXs had a limited growth path, Djurdjevic said. "At the end of that path, they had to switch to IBM, Tandem or whoever."

Yet, in a few years, DEC and IBM may well meet head-to-head on newer applications fields, several analysts said.

Potential markets for the big VAX include large research and development labs or commercial sites where mergers or acquisitions have expanded the need for decision-support systems. Several analysts predicted that DEC's sagging revenue will not get a substantial boost from 9000 sales until at least 1991.

Climb to the top

DEC's VAX 9000 series takes the company into new realms of processing power

	Model 210	Model 410	Model 420	Model 430	Model 440
Number of CPUs	1	1	2	3	4
Maximum relative performance* (MIPS)	30	30	59	88	117
Minimum/maximum memory	256M bytes/ 512M bytes	256M bytes/ 512M bytes	256M bytes/ 512M bytes	512M bytes	512M bytes
Maximum I/O throughput	80M byte/sec.	160M byte/sec.	160M byte/sec.	320M byte/sec.	320M byte/sec.
Base price (millions)	$1.24	$1.69	$2.22	$3.40	$3.92

*In comparison with VAX 11/780

SOURCE: DIGITAL EQUIPMENT CORP — CW CHART: FRANK C. O'CONNELL

Backup vocals

A new version of RDB was tucked away among DEC's hardware announcements last week. RDB Version 3.1, scheduled for December availability, adopts additional ANSI-standard SQL features as well as some new functionality aimed at production systems. It is not, however, considered a major release.

Referential integrity support was enhanced with the inclusion of "triggers" in order to define related data that must be acted on based on a delete or update action. On-line backup as well as restore can now be done by area, allowing more flexibility and control. RDB can be backed up on compact disc/read-only memory.

Other related announcements include the following:

- Vector processors — Integrated vector processors for the VAX 9000 and VAX 6000 Models 410-440 to increase compute-intensive processing speeds up to 10 times. Prices range from $25,000 to $57,000. Available summer 1990.
- KDM70 disk and tape controller — a single-host disk and tape controller providing local access to the VAX 9000 XMI bus at rates up to 700 I/O requests per second. Priced at $23,700. Available spring 1990.
- VAX Disk Striping Driver — Enables parallel execution of multiple requests for data by spreading applications and data over several disk drives. Available in December for all VAXs except the Microvax 3100.
- CIXCD High Performance Interface — A single-module I/O interface that can improve Vaxcluster system I/O performance up to four times faster than current CI interfaces. Priced at $35,000. Available spring 1990.
- VAX System Management Software — New products include DEC's Data Center Monitor for operations management and V-X PACS from UIS, Inc. for resource accounting and chargeback. Available spring 1990.

MARYFRAN JOHNSON

First course of 9000's VMS offers little nourishment

BY MARYFRAN JOHNSON
CW STAFF

When it finally starts shipping in volume next spring, the VAX 9000 will have its own field-test version of the VMS operating system. However, aside from a vector processing facility, the earliest VMS version will contain few new features.

The first trickle of operating system enhancements will be in the transaction processing arena, company officials confirmed last week.

"The big card for them with this system is the VMS compatibility," said Raymond Moss, deputy director for computers and communication at the U.S. Air Force Logistics Command (USAFLC) in Odgen, Utah.

The USAF operation runs several Digital Equipment Corp. machines, both as stand-alones and in clusters, in Moss' department. Yet, like so many commercial sites, the USAFLC runs most of its business and accounting functions on IBM mainframes.

"I'll wait until I see some performance numbers," said Mike Beardslee, MIS director at the Utah-based Thiokol Corp., which uses Vaxclusters for distributed and central processing.

"What was significant in my mind was that DEC has the opportunity now to sell to the business world," Beardslee said.

Thiokol, which manufactures aerospace equipment, just emerged from a corporate split this summer with Morton International. The corporate headquarters and its associated computer equipment went along with Morton, leaving Thiokol to build up its own, Beardslee explained.

The appearance of the DEC mainframe at least puts the company in the running to fill that void, the MIS director said, since the combined capabilities of high throughput and enhanced storage capacity make the VAX 9000 "a true mainframe."

Software AG stretches its range

BY AMY CORTESE
CW STAFF

ANAHEIM, Calif. — Software AG of North America, Inc. last week continued its efforts to broaden its product range with a variety of offerings, including an alternative to IBM's AD/Cycle.

The product announcements for both the Digital Equipment Corp. VAX and IBM environments occurred as 2,200 users gathered for the annual Software AG user conference.

Among the highlights was the introduction of the Predict CASE repository and development environment. Predict CASE has been available on IBM mainframes in Europe for two years, and with the U.S. debut of Version 2, a personal computer-based front end has been added.

While Software AG is committed to supporting IBM's AD/Cycle framework, "there is room to offer alternative tool sets," said Tim Wild, Software AG vice-president of product marketing.

Many customers have been using Software AG's Predict data dictionary and Natural fourth-generation language (4GL) since they became available in the early and mid-1980s.

Fred Frudden, manager of data administration at pharmaceutical concern A. H. Robins, said that the Predict data dictionary "is far superior to anything IBM offers. AD/Cycle is so far down the road, we have no plans to even address it yet."

The Natural 4GL was also the focus of new developments. An OS/2 version was announced that provides a development and execution environment for that platform. Interfaces to DEC's RDB and RMS database management systems were also added to Natural for VAX environments.

Additionally, Software AG expanded its line of data center management software with Natural Console, an automated console management system, and Natural ISPF, a development and system utilities tool for IBM mainframe environments. A communications software package called Net-work APPC, which provides IBM's Advanced Program-to-Program Communication-type communications across different environments, rounded out the entries.

All the products are slated for general availability in the first quarter of 1990 and vary in price according to platform and configuration.

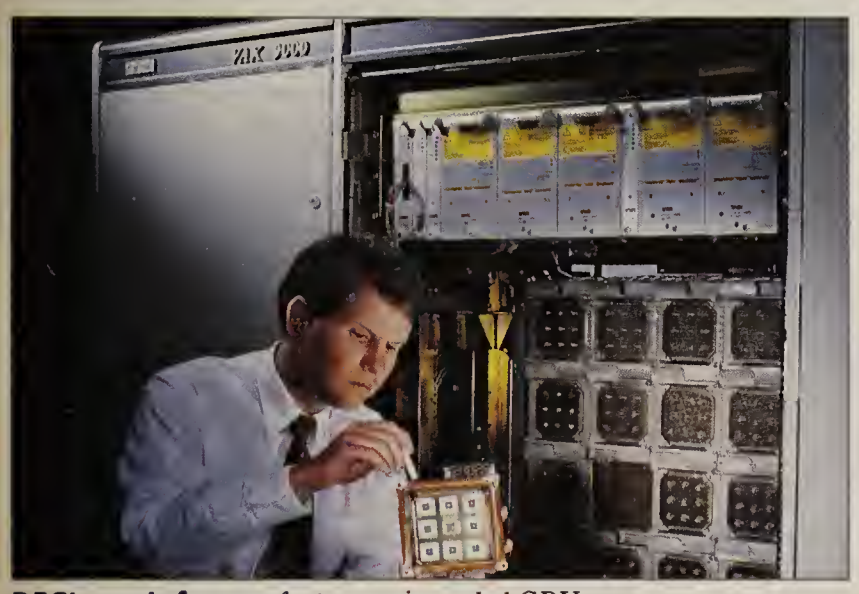
Mainframe

FROM PAGE 1

on IBM mainframes, and we consider ourselves to be an IBM shop," said Robert Tanner, senior vice-president of the trust and financial services business unit at Northern Trust Co. in Chicago. "However, our VAX installation is bigger. We have more processing, disk storage and memory on the VAXs. But we have more development people on the IBM, where our core accounting system is."

The Royal Bank of Canada has long used Tandem systems for specific banking operations. The bank will likely upgrade to the new mainframe in the future, but it will not be considered for host operations.

"We think of it as a big switch because it front-ends our transaction processing systems," said Greg Pruden, manager of technical support at the Royal Bank, of his Tandem installation. "As far as we're concerned, there are three mainframe vendors: IBM, Amdahl and NAS."



DEC's mainframe *features air-cooled CPUs*

However, such clear barriers didn't deter DEC and Tandem. Users and analysts said last week that both companies have been driven to the high end because it represents one of the last remaining sources of growth and high-profit margins.

"The marketplace is moving in two directions, either to high-end systems or low-end," said Frank Gens, an analyst at Framingham, Mass.-based IDC Financial Services Corp. "The midrange seems to be a no-man's-land. So, DEC and Tandem need to aim for a piece of high-end business."

What is unclear, is how much of a piece DEC and Tandem will get. Because observers say the chances are slim for the two to replace IBM hosts, the companies' potential revenue gains cannot be measured by the current market revenue totals.

Dataquest, Inc. estimates that the mainframe market will grow by 4.5% in 1989, nearly $30 billion in revenue. But to say that DEC or Tandem could grab a tiny slice of that $30 billion could be misleading because, when users spoke of how they would use a DEC or Tandem system, they were often referring to specialized operations that have yet to be developed.

"I would consider Tandem if we got into an applications area that would fit them, like high-volume transaction processing," said Gary Gage, director of data center services at Teco Energy Co. in Tampa, Fla. "If it were a brand-new system we were implementing, I'd consider it. If it involved a conversion from the 370, I wouldn't consider it."

But users and analysts suggested last week that companies like DEC and Tandem are willing to go after these futures because of the potential big money.

"What's key here is the economics that IBM has enjoyed," said Jack Cooper, president of CSX Technology, the IS arm of CSX Corp. "If they can get in and establish themselves, they can enjoy that high-profit margin, or at least one with a good return."

For DEC specifically, the mainframe introduction was seen by many as a no-choice move. Observers said the company was forced to bring out a large system to hang onto its high-end customers.

"Clearly, a company like Digital realizes that being forced to share account control with a competitor is not going to help them sell other systems in the long term," said Peter Burris, head of IBM research at International Data Corp.

Senior Writer Maryfran Johnson contributed to this report.

IBM unleashes 3090 J line

BY ROSEMARY HAMILTON
CW STAFF

NEW YORK — IBM would apparently like to remind the industry that it is the mainframe company of record.

With two newcomers stepping into the mainframe market, IBM last week trotted out 16 new 3090s as well as software targeted at the heart of mainframe operations, batch processing and system security.

Although the software was warmly received, IBM customers contacted last week had a hohum reaction to the 3090 J series. They view it as little more than a modest increase in performance.

The overall boost is 7% to 14%, achieved by tweaking the processor's cycle time and doubling the cache size. Beyond that, the new mainframes offered little new technology.

Worth noting

The most noteworthy hardware item was the 4M-bit chip on high-end J models. It is IBM's first use of the chip in its mainframe line, and it boosts the maximum processor memory from 2.5G bytes to 4.5G bytes.

IBM's mainframe rollout included an asymmetrical capability for central storage on the new processors and enhancements to PR/SM, its mainframe partitioning capability.

The new batch-processing software, however, is another story. Users applauded IBM's move to provide a quicker way to run batch jobs.

"I'll put it in just as quickly as it's available," said David Moore, senior vice-president of information processing at Mellon Bank in Pittsburgh.

The Hiperbatch software, in conjunction with new microcode called the Move Page facility, is designed to reduce batch-processing time by as much as 60%, according to IBM. The company will make it available as a no-cost component of a new release of ESA announced last week and due out by year's end. Hiperbatch will work with the new J models as well as the midrange and high-end models in the 3090 S series.

The software is IBM's latest facility to take advantage of the company's Hiperspace concept, a key component of the ESA operating system that opens up the on-processor storage to the multiple gigabyte range.

Hiperbatch will allow users to move huge chunks of data for batch processing to the processor, which will eliminate the time spent going out to disk to retrieve data. In addition, the Move Page facility is designed to move data more quickly from the Hiperspaces in expanded storage to central storage for execution.

"I think the 60% is a real stretch, but it could be true for someone who hasn't spent much time fixing their batch operations," Moore said. "But if I can get in the range of 25% to 30%, I will be absolutely overjoyed."

However, users contacted last week could not be described as overjoyed about the new mainframes. Nobody was disappointed, and they naturally welcomed the performance boost. But users also said there was little that knocked them out about the J models.

"There was nothing earthshaking about this," said Jack Cooper, president of CSX Technology, which provides IS services to CSX Corp. "We'll be looking to move to a J the first of the year."

However, IBM is counting on moving J models well before the beginning of the year. The company said it would be ready to ship 13 of the 16 models by the end of last week, and analysts said that IBM is hoping the new mainframes will bring a well-needed boost to its fourth-quarter sales.

"We have no solid evidence that there's been a downturn in sales, but they wanted the J's shipping to make it easier to close deals," said Peter Burris, head of IBM research at International Data Corp. in Framingham, Mass.

Some users and analysts speculated that IBM wants to move away from the S models because of their history of technological problems.

Saving the S

At the same time, it does not want to officially cancel the product line in case it runs into shipment delays with J models. If that were to happen, IBM could provide S models to hold customers over until J models become available.

IBM said it will continue to sell S models and will not reduce their prices. Interestingly, the J models have nearly the same price tags, which leave little, if any, incentive to buy a new S model. For instance, the 3090 Model 400J will sell for $9,884,800, while a 400S sells for $9,885,000.

In addition, users with S models on order reported that IBM was switching them to J models.

"We were anticipating purchasing an S upgrade, but we'll look closely to the J now," said Greg Ehlers, vice-president of information services at Teco Energy Co. in Tampa, Fla. "Our feedback is that anyone with an S on order automatically gets the J. I guess that nails the coffin shut on the S."

Splitting the series

The IBM mainframes introduced last week show the company's intent to split the 3090 product line and target the systems at different sophistication levels, observers said.

Most of the new whiz-bang features, such as Hiperbatch, the enhanced PR/SM and the maximum 4.5G bytes of processor storage, are available on Models 180J and above. Low-end models are priced competitively, but they do not have the new features.

The entry-level J model, which sells for $830,000 and does not support the advanced features, is in the 4381 price range, said Frank Gens, an analyst at IDC Financial Services Corp.

"IBM has finally responded to the fact that low-end customers have historically paid the worst price/performance because the low end was paying for all the advanced technology that the higher-end customers needed," Gens said.

The 3090 J introduction included a new twist in the way IBM sells mainframes. Three special low-end systems, called JH models, will be available in late 1990. They will be priced slightly higher than the corresponding J models and will offer most of the new J features introduced for higher end models.

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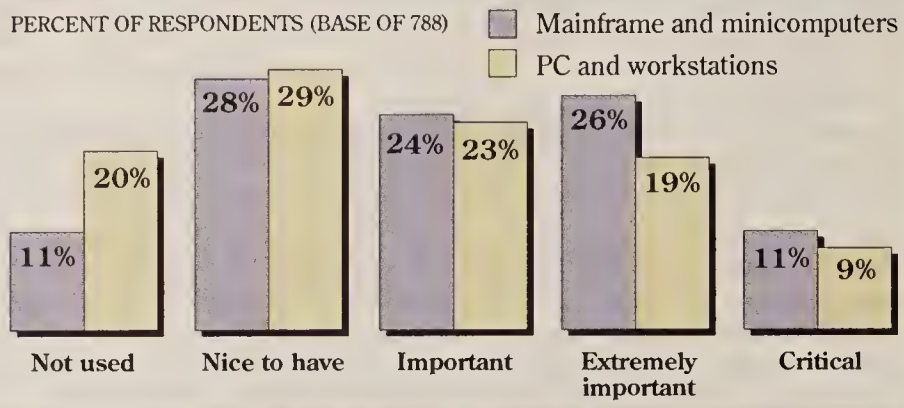
TRENDS

Multivendor Services

A single vendor servicing all your computers regardless of their make offers a definite convenience. Trouble is, most users don't know enough about the programs to commit to them.

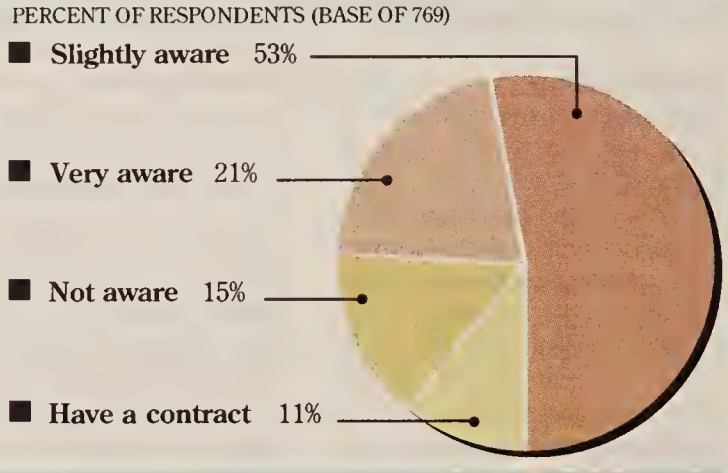
Importance of single-vendor responsibility

The majority of both large and small computing environments say single-vendor responsibility is nice to have, but more than 36% of the respondents with mainframes and minis indicated that it was either extremely important or even critical.



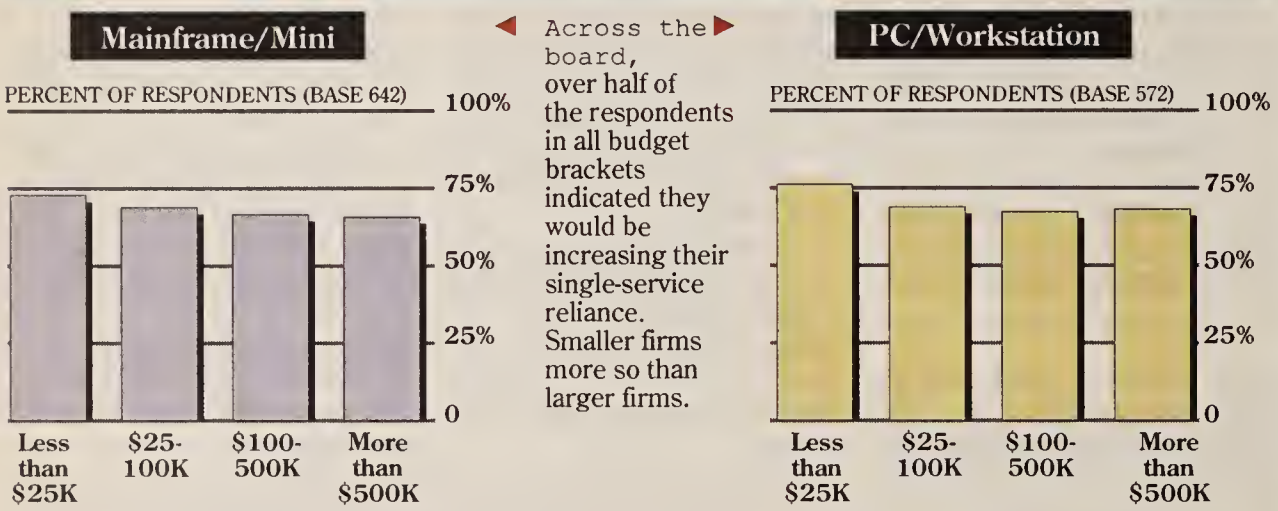
Awareness of multivendor service programs

Over half the respondents realize that vendors offer programs that will service other vendors' machines, but they do not have all the details. Thirty-two percent are either well aware of the program or already have a contract.



Percent planning to increase single-vendor reliance by budget

Across the board, over half of the respondents in all budget brackets indicated they would be increasing their single-service reliance. Smaller firms more so than larger firms.



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NEXT WEEK

Hype has threatened to overcome hypertext ever since author/visionary/hipster **Ted Nelson** published his seminal book, *Computer Lib/Dream Machines*, in 1974. Is hypertext more than a facade with no building? In Depth looks beyond the hype at issues, trends and the development of Ford's hypertext-based diagnostic system.

MARK FISHER

Ford's revamped supplier payment procedure and Rubbermaid's new order processing system have much in common. They involved corporate procedure rethinking; they were enabled by information technology; and their tales were told at Hammer Forum '89. Read about them and other IS business transformations in Manager's Journal.

INSIDE LINES

Aftershocks

The aftershocks may have subsided in the Bay Area, but watch for them to hit earnings reports in the next quarter. Chip manufacturer VLSI Research in San Jose, Calif., says work time lost because of the temblor may result in a loss of as much as $169 million. And that could grow: Vendors up and down the Silicon Valley are testing and retesting manufacturing equipment jolted by the quake and may not know the full financial repercussions for weeks.

Long-distance hackers

U.S. Sprint has been so successful in warding off hackers out to steal the long-distance carrier's authorization codes that the hackers are now turning their "phreaking" activities on private branch exchanges (PBX) operated by businesses and government, according to Bob Fox, U.S. Sprint's vice-president of corporate security. Hackers break into private telephone switches to place long-distance telephone calls that are billed to the PBX owner. The break-ins are not discovered until the bill arrives, he said. U.S. Sprint is touting a new program aimed at educating business customers about telecommunications fraud.

Can you cope with COPICS?

Users of IBM's COPICS will "not exactly jump for joy" to learn that the new version of the CICS-based MRP and manufacturing control system, announced last week, provides no migration path from the old, according to Richard Miller, an IS director at a Westinghouse group who heard the bad news from a colleague who attended IBM's CIM announcement. While the new version natively provides features that users have hitherto had to write themselves, it'll cost current users about half a million to get it, Miller estimated.

Just in case?

We all know that Lotus is no fan of Microsoft's Windows, preferring to put its eggs in the Presentation Manager basket. But all its eggs? A source close to both communities claims that Lotus has a team of 40 programmers working on a range of Windows projects — just in case, of course.

This LAN is DEC's LAN, sometime

DEC is big on getting the most mileage possible from predelivery product announcements — it spent the last three years announcing Decnet OSI Phase V over and over again, and no, it's still not available. Well, DEC is expected to reaffirm its support for OS/2 LAN Manager again at Microsoft's LAN Manager announcement next week. A week later, at a separate DEC briefing, sources say to look for the unveiling, although not necessarily the delivery, of VAX/VMS Services for OS/2, which will have LAN Manager support.

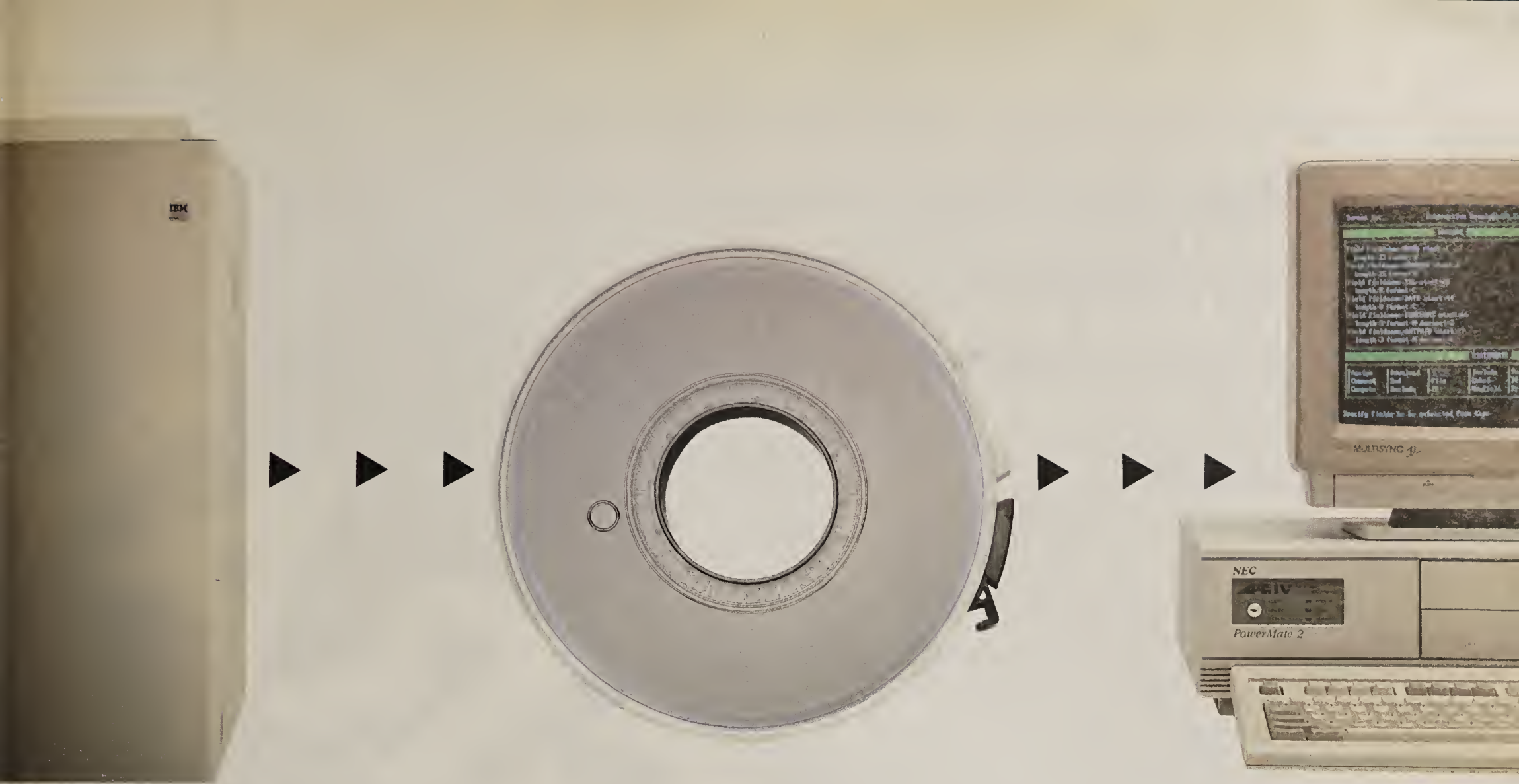
Got a sec? Here's 60 million instructions

Mips Computer Systems is expected to turn up the heat in the reduced instruction set computing market this week with the rollout of a chip that can perform up to 60 million instructions per second — about three times the speed of its current chips.

What's good for the goose . . .

While Borland CEO Phillippe Kahn cleaned up a shattered office less than five miles from the quake's epicenter, a message appeared on Microsoft's electronic bulletin board that read: "Unlike Brand X (GRIN), the earthquake can't affect Microsoft. Because of our diversified staff, even the eruption of Mount Rainier can't shut us down. We're still here to answer your questions." Microsoft officials have since apologized, saying the act was the product of a lone customer service representative. Pretty tasteless, but then again, Kahn was the prankster who slipped copies of a magazine with negative Lotus stories under the doors of attendees at a PC industry conference last year.

We don't dwell on the tasteless here; it just seems that's the type of dope people like to feed us. But we're always open to tasteful news, so long as we can get our teeth into it. Contact News Editor Pete Bartolik at 800-343-6474.



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